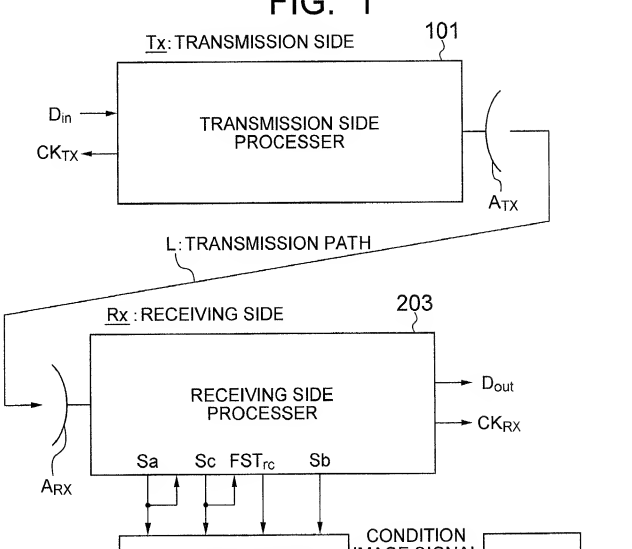
FOREIGN CITATION

FIG. 1



E 5993

FIG. 2A

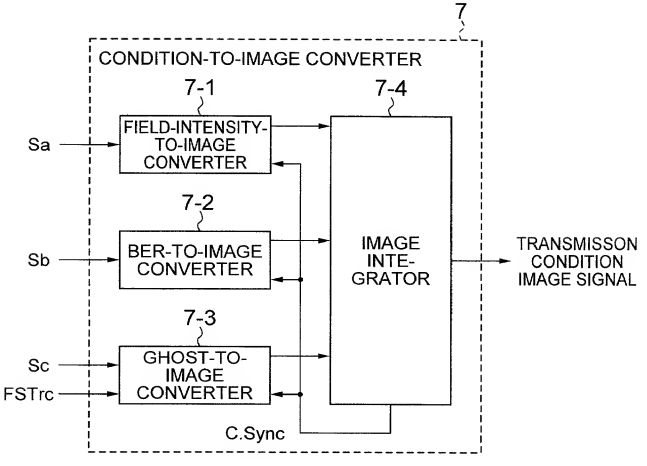

7
CONDITION-TO-IMAGE CONVERTER
7-1
7-4
Sa
FIELD-INTENSITY-TO-IMAGE CONVERTER
7-2
Sb
BER-TO-IMAGE CONVERTER
IMAGE INTE-GRATOR
TRANSMISSON CONDITION IMAGE SIGNAL
7-3
Sc
FSTrc
GHOST-TO-IMAGE CONVERTER
C.Sync

FIG. 2B

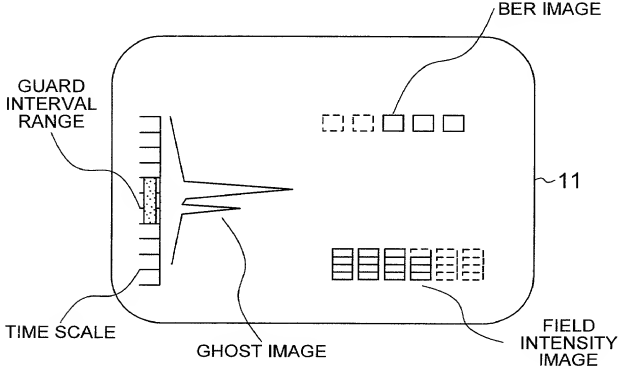

BER IMAGE
GUARD INTERVAL RANGE
11
TIME SCALE
GHOST IMAGE
FIELD INTENSITY IMAGE

FIG. 3A

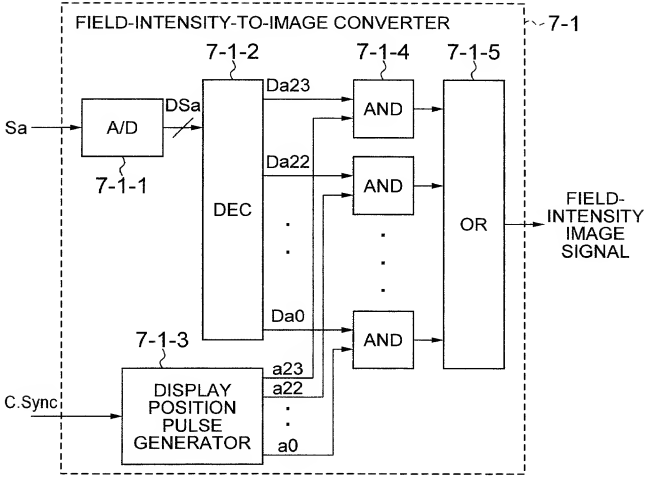

FIELD-INTENSITY-TO-IMAGE CONVERTER
7-1
7-1-2
7-1-4
7-1-5
Sa
A/D
DSa
7-1-1
DEC
Da23
Da22
Da0
AND
AND
AND
OR
FIELD-INTENSITY IMAGE SIGNAL
7-1-3
C.Sync
DISPLAY POSITION PULSE GENERATOR
a23
a22
a0

FIG. 3B

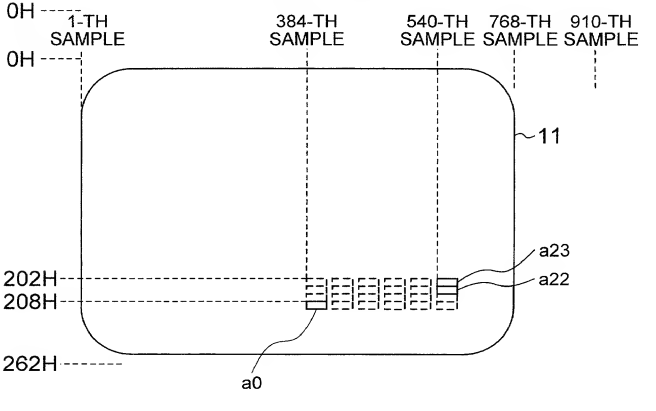

0H
1-TH SAMPLE
384-TH SAMPLE
540-TH SAMPLE
768-TH SAMPLE
910-TH SAMPLE
0H
11
a23
a22
202H
208H
262H
a0

FIG. 4A

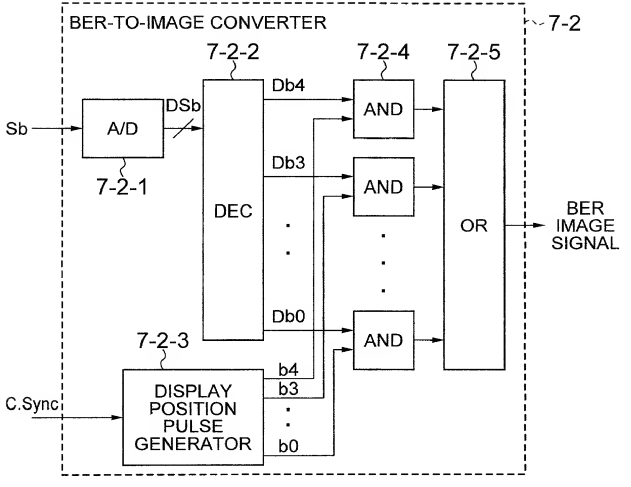

BER-TO-IMAGE CONVERTER
7-2
7-2-2
7-2-4
7-2-5
Sb
A/D
DSb
7-2-1
DEC
Db4
Db3
Db0
AND
AND
AND
OR
BER IMAGE SIGNAL
7-2-3
C.Sync
DISPLAY POSITION PULSE GENERATOR
b4
b3
b0

FIG. 4B

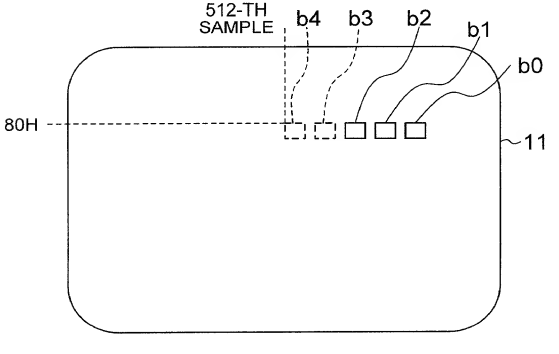

512-TH SAMPLE
b4
b3
b2
b1
b0
80H
11

FIG. 5

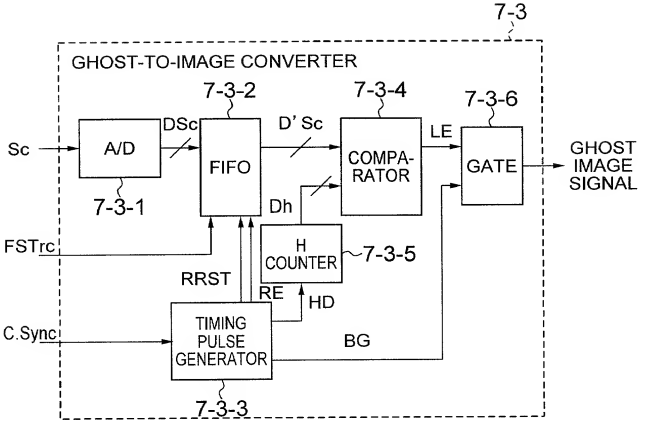

7-3
GHOST-TO-IMAGE CONVERTER
7-3-2
7-3-4
7-3-6
Sc
A/D
DSc
FIFO
D' Sc
COMPA-
RATOR
LE
GATE
GHOST
IMAGE
SIGNAL
7-3-1
Dh
FSTrc
H
COUNTER
7-3-5
RRST
RE
HD
C.Sync
TIMING
PULSE
GENERATOR
BG
7-3-3

FIG. 6

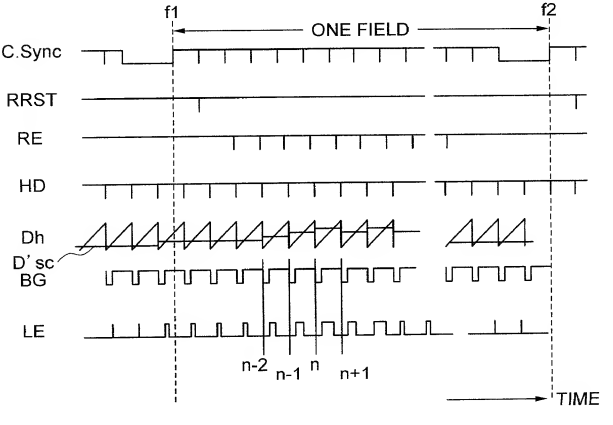

f1
ONE FIELD
f2
C.Sync
RRST
RE
HD
Dh
D' sc
BG
LE
n-2
n-1
n
n+1
TIME

FIG. 7

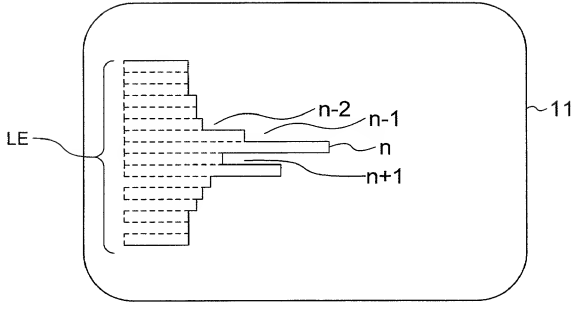

LE
n-2
n-1
n
n+1
11

FIG. 8

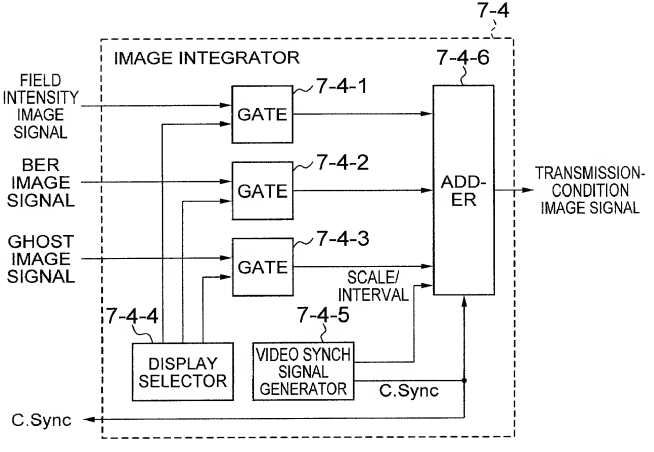

7-4
IMAGE INTEGRATOR
7-4-6
FIELD INTENSITY IMAGE SIGNAL
7-4-1
GATE
BER IMAGE SIGNAL
7-4-2
GATE
ADD-ER
TRANSMISSION-CONDITION IMAGE SIGNAL
GHOST IMAGE SIGNAL
7-4-3
GATE
SCALE/ INTERVAL
7-4-4
7-4-5
DISPLAY SELECTOR
VIDEO SYNCH SIGNAL GENERATOR
C.Sync
C.Sync

FIG. 9A

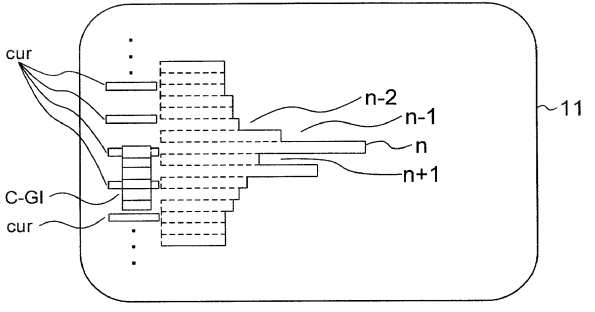


FIG. 9B

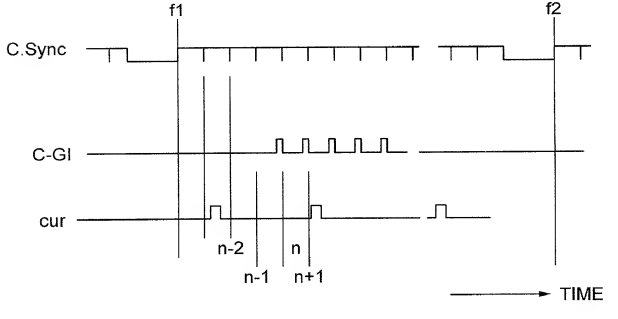


FIG. 10A

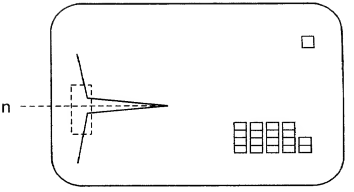


FIG. 10B

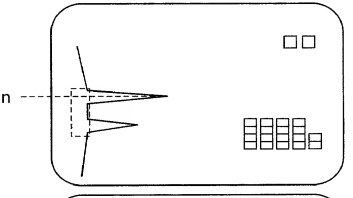


FIG. 10C

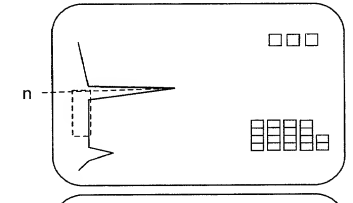


FIG. 10D

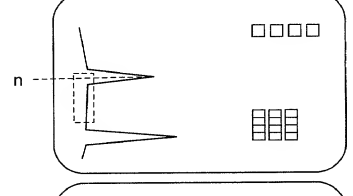
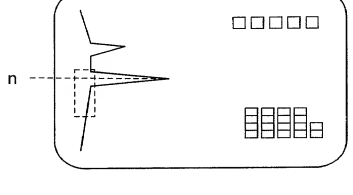
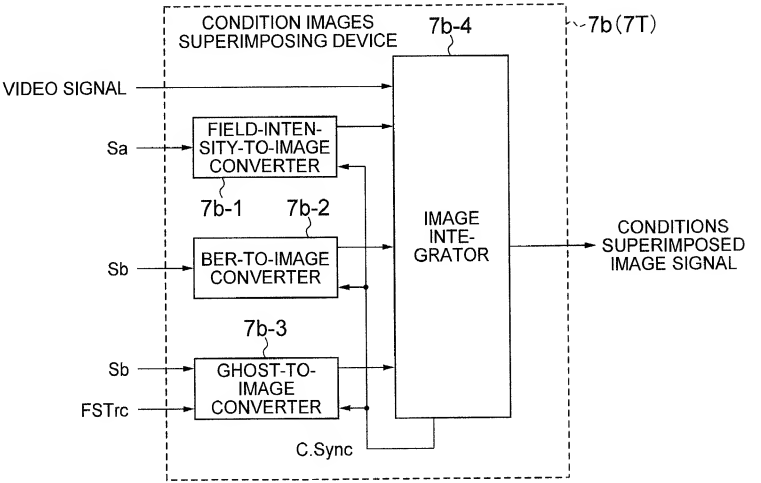


FIG. 10E



TOSHIBA CETH1060

FIG. 11



TOSHIBA CORPORATION

FIG. 12

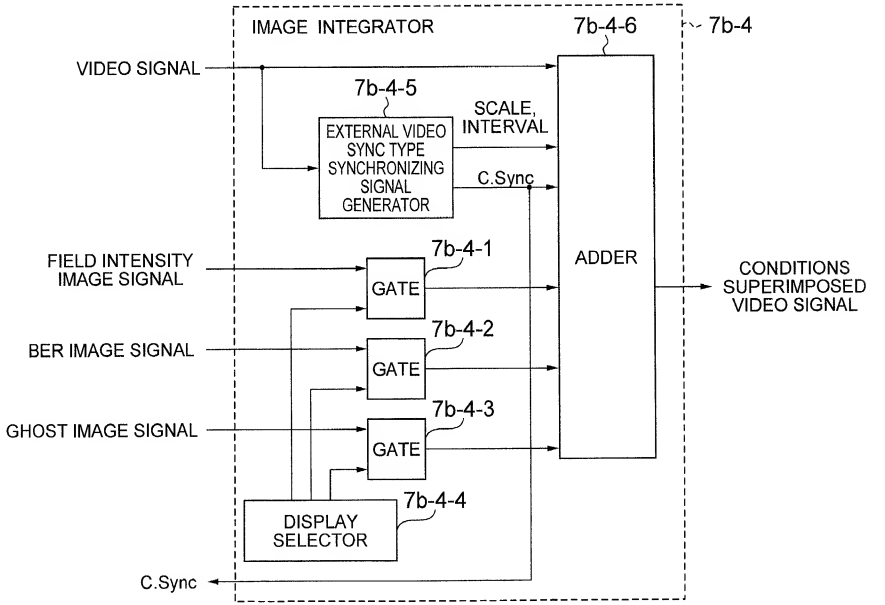


FIG. 13

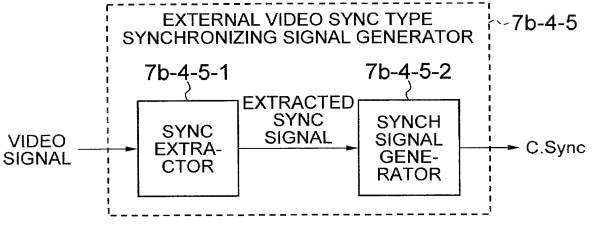

EXTERNAL VIDEO SYNC TYPE
SYNCHRONIZING SIGNAL GENERATOR
7b-4-5
7b-4-5-1
7b-4-5-2
VIDEO
SIGNAL
SYNC
EXTRA-
CTOR
EXTRACTED
SYNC
SIGNAL
SYNCH
SIGNAL
GENE-
RATOR
C.Sync

FIG. 14

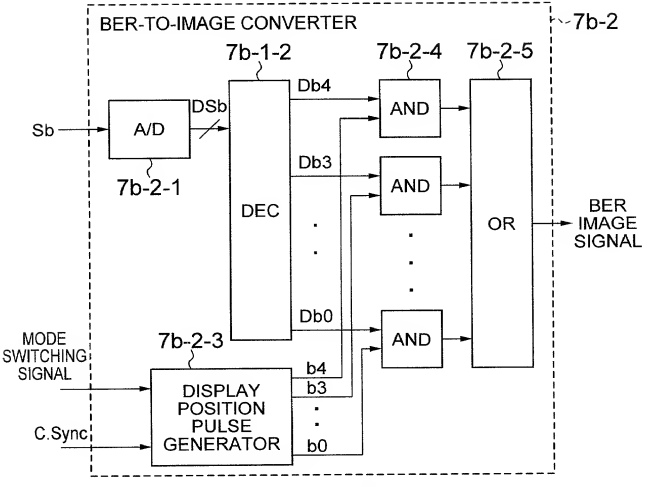
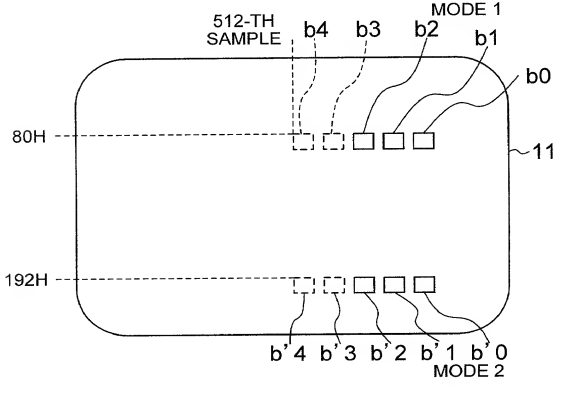

BER-TO-IMAGE CONVERTER
7b-2
7b-1-2
7b-2-4
7b-2-5
Sb
A/D
DSb
7b-2-1
DEC
Db4
Db3
Db0
AND
AND
AND
OR
BER IMAGE SIGNAL
MODE SWITCHING SIGNAL
7b-2-3
DISPLAY POSITION PULSE GENERATOR
b4
b3
b0
C.Sync

FIG. 15


512-TH SAMPLE
MODE 1
b4
b3
b2
b1
b0
80H
11
192H
b'4
b'3
b'2
b'1
b'0
MODE 2

TOSHIBA EC-H1060

FIG. 16

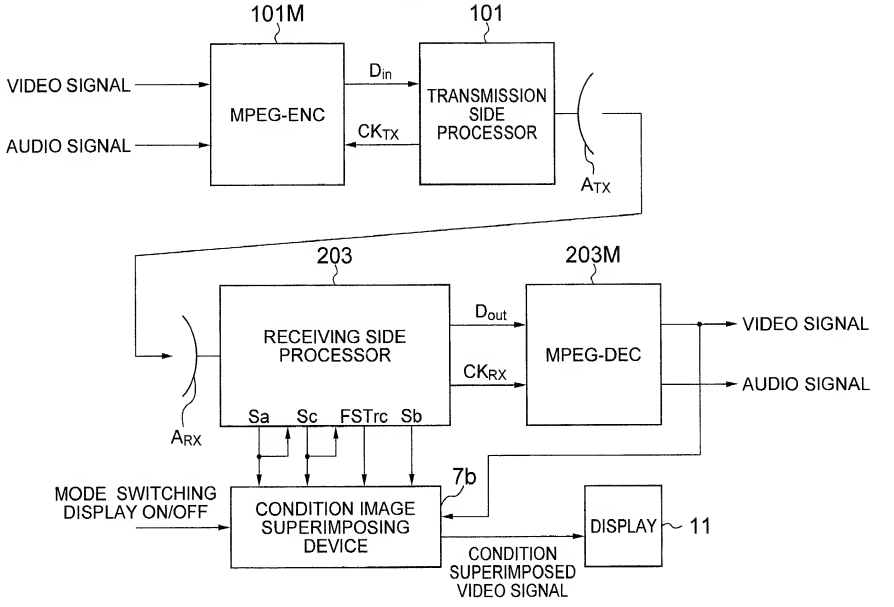
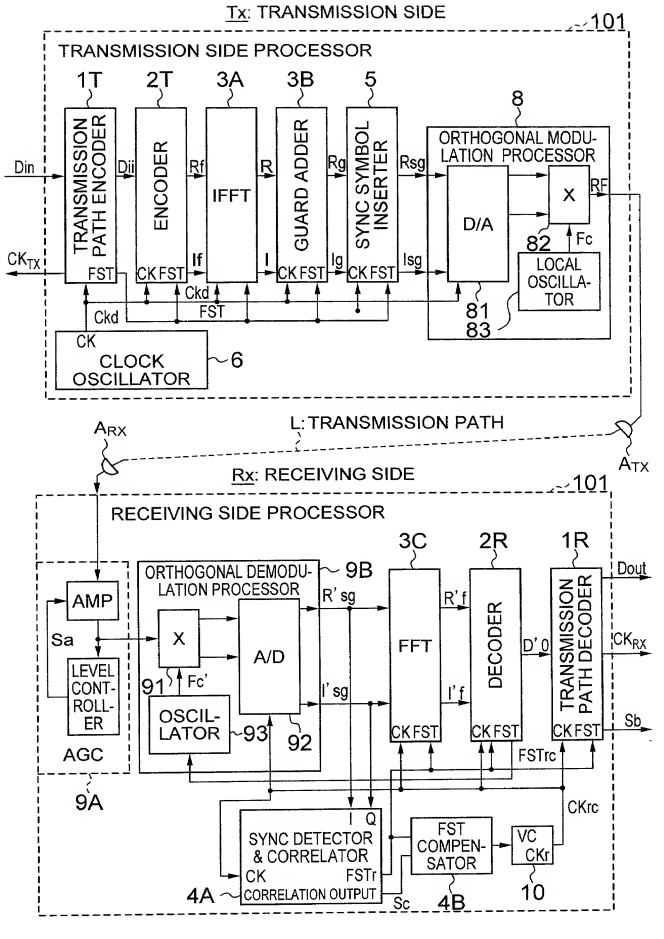


FIG. 17


Tx: TRANSMISSION SIDE
101
TRANSMISSION SIDE PROCESSOR
1T
2T
3A
3B
5
8
TRANSMISSION PATH ENCODER
ENCODER
IFFT
GUARD ADDER
SYNC SYMBOL INSERTER
ORTHOGONAL MODULATION PROCESSOR
Din
Dii
Rf
R
Rg
Rsg
D/A
X
RF
Fc
82
LOCAL OSCILLATOR
CK_TX
FST
CK FST
If
I
Ig
Isg
Ckd
FST
81
83
CK
CLOCK OSCILLATOR
6
A_RX
L: TRANSMISSION PATH
A_TX
Rx: RECEIVING SIDE
101
RECEIVING SIDE PROCESSOR
3C
2R
1R
AMP
Sa
LEVEL CONTROLLER
AGC
9A
ORTHOGONAL DEMODULATION PROCESSOR
9B
X
A/D
OSCILLATOR
91
Fc'
93
92
R' sg
I' sg
FFT
R' f
I' f
DECODER
D' 0
TRANSMISSION PATH DECODER
Dout
CK_RX
Sb
FSTrc
CKrc
I Q
SYNC DETECTOR & CORRELATOR
CK
FSTr
CORRELATION OUTPUT
4A
Sc
FST COMPENSATOR
4B
VC CKr
10

TOSHIBA CCITT060

FIG. 18

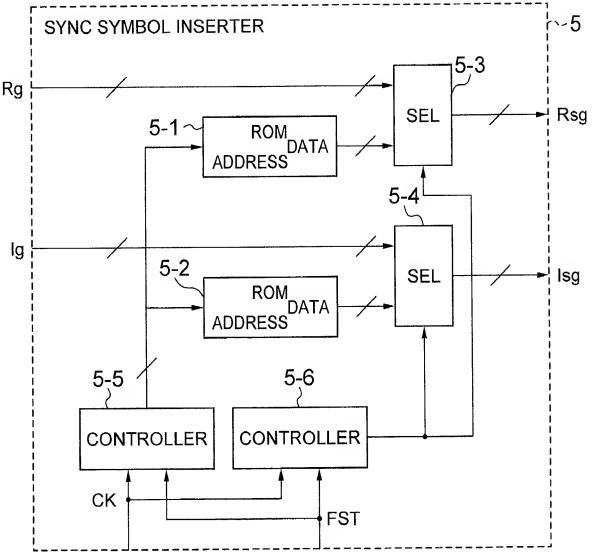
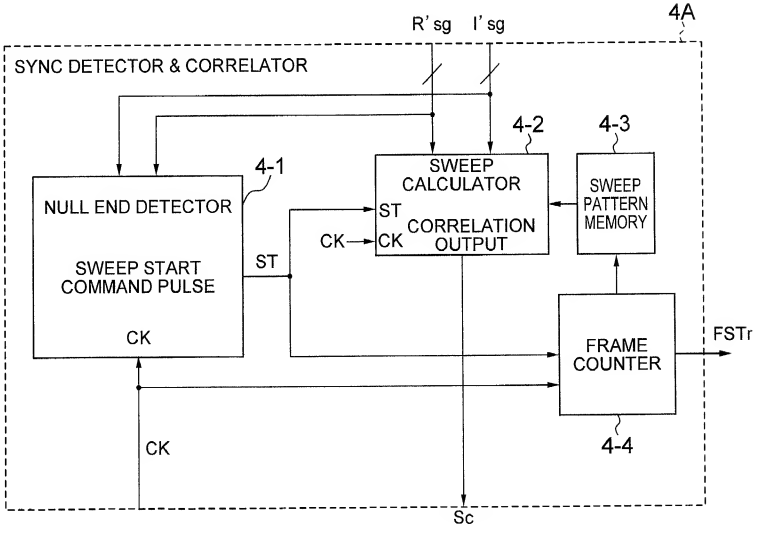


FIG. 19


R' sg
I' sg
4A
SYNC DETECTOR & CORRELATOR
4-2
4-3
4-1
SWEEP CALCULATOR
NULL END DETECTOR
ST
CK
CK
CORRELATION OUTPUT
SWEEP PATTERN MEMORY
SWEEP START COMMAND PULSE
ST
CK
FRAME COUNTER
FSTr
CK
4-4
Sc

TOSHIBA CORPORATION

FIG. 20

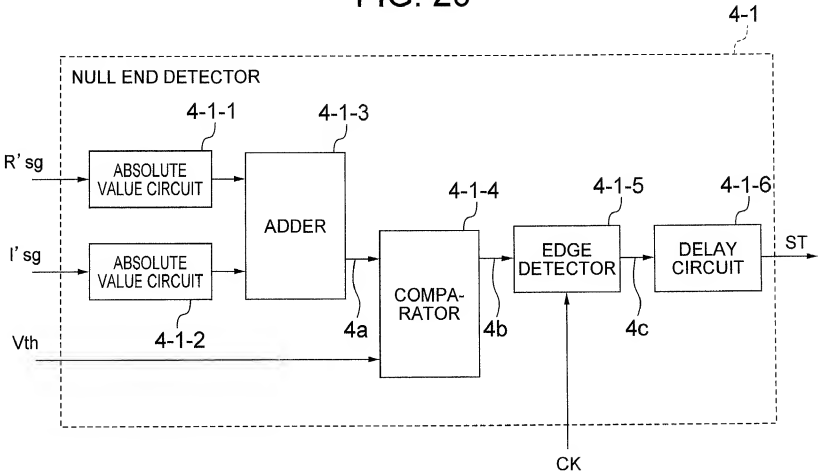


FIG. 21

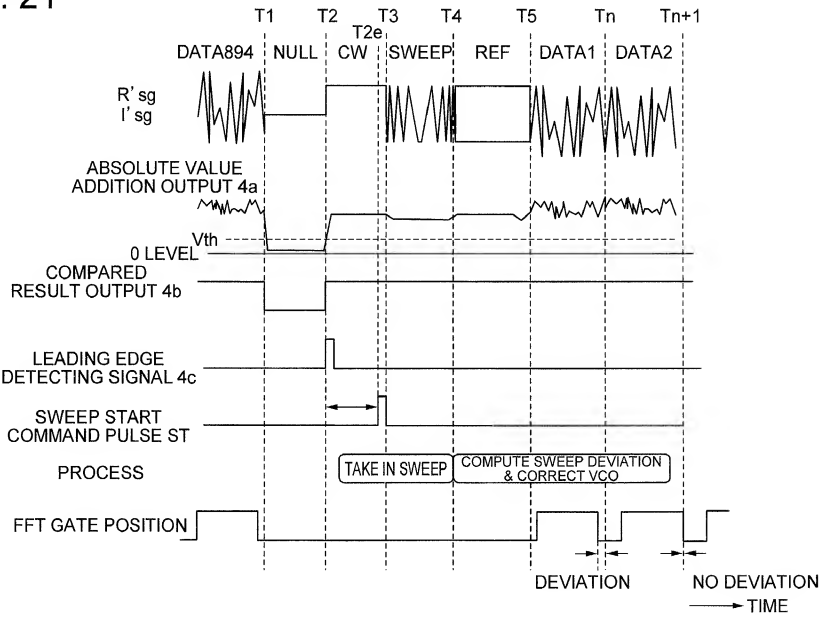

T1
T2
T3
T2e
T4
T5
Tn
Tn+1
DATA894
NULL
CW
SWEEP
REF
DATA1
DATA2
R' sg
I' sg
ABSOLUTE VALUE
ADDITION OUTPUT 4a
Vth
0 LEVEL
COMPARED
RESULT OUTPUT 4b
LEADING EDGE
DETECTING SIGNAL 4c
SWEEP START
COMMAND PULSE ST
PROCESS
TAKE IN SWEEP
COMPUTE SWEEP DEVIATION
& CORRECT VCO
FFT GATE POSITION
DEVIATION
NO DEVIATION
TIME

FIG. 22A

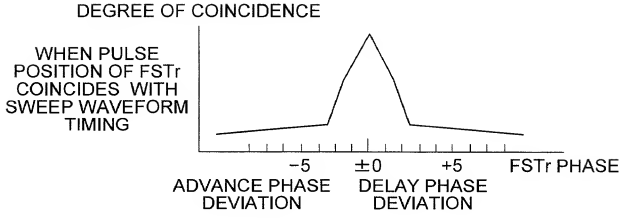


FIG. 22B

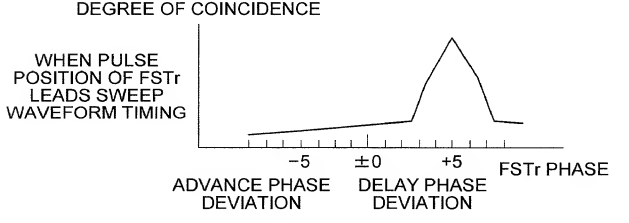


FIG. 22C

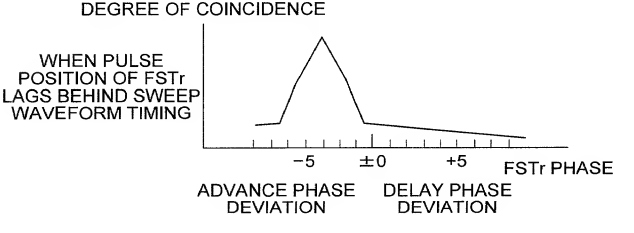


FIG. 23

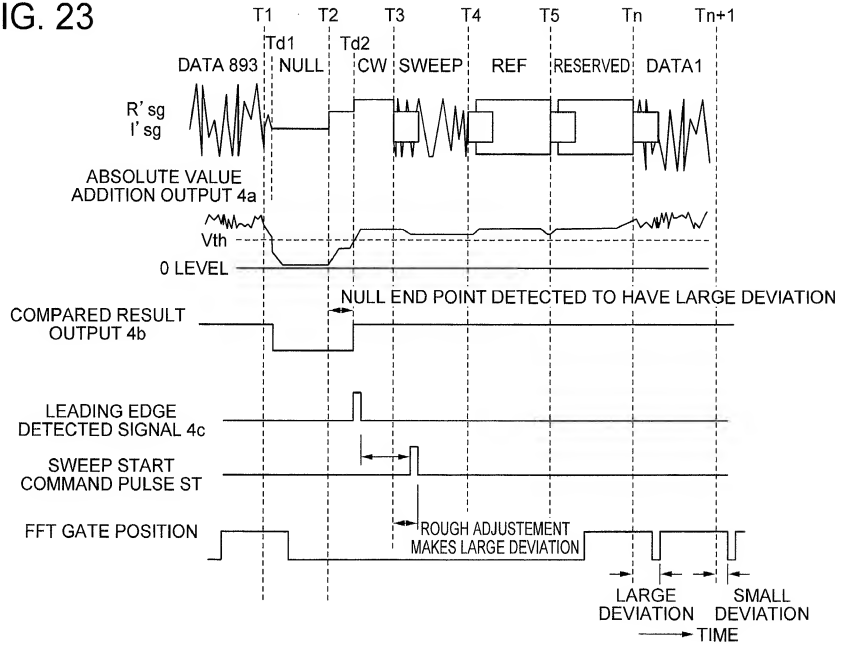
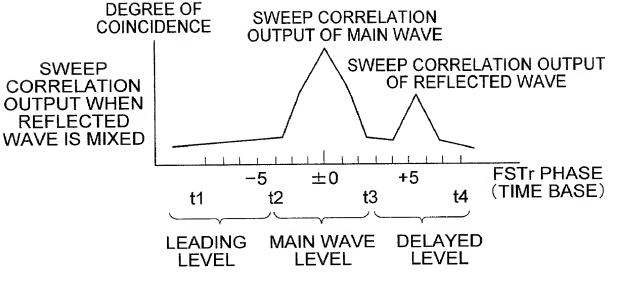

T1
T2
T3
T4
T5
Tn
Tn+1
Td1
Td2
DATA 893
NULL
CW
SWEEP
REF
RESERVED
DATA1
R' sg
I' sg
ABSOLUTE VALUE ADDITION OUTPUT 4a
Vth
0 LEVEL
NULL END POINT DETECTED TO HAVE LARGE DEVIATION
COMPARED RESULT OUTPUT 4b
LEADING EDGE DETECTED SIGNAL 4c
SWEEP START COMMAND PULSE ST
FFT GATE POSITION
ROUGH ADJUSTEMENT MAKES LARGE DEVIATION
LARGE DEVIATION
SMALL DEVIATION
TIME

FIG. 24


DEGREE OF COINCIDENCE
SWEEP CORRELATION OUTPUT OF MAIN WAVE
SWEEP CORRELATION OUTPUT OF REFLECTED WAVE
SWEEP CORRELATION OUTPUT WHEN REFLECTED WAVE IS MIXED
−5
±0
+5
FSTr PHASE (TIME BASE)
t1
t2
t3
t4
LEADING LEVEL
MAIN WAVE LEVEL
DELAYED LEVEL

PASSED CERTIFIED

FIG. 25

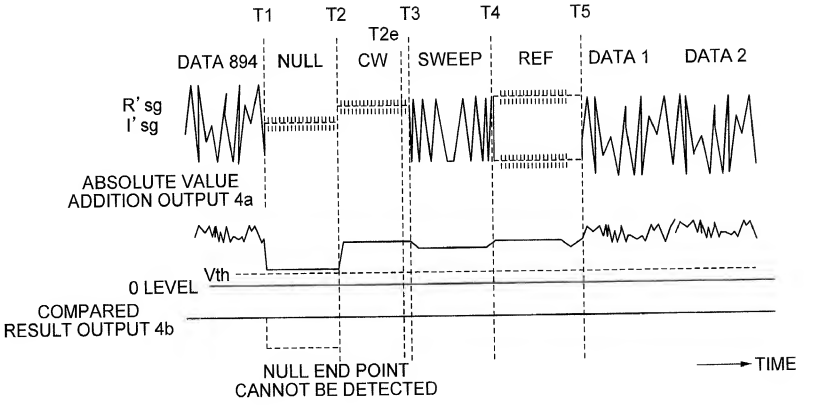


FIG. 26

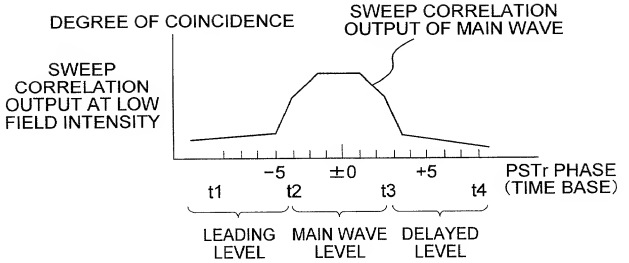

DEGREE OF COINCIDENCE
SWEEP CORRELATION OUTPUT OF MAIN WAVE
SWEEP CORRELATION OUTPUT AT LOW FIELD INTENSITY
−5
±0
+5
PSTr PHASE (TIME BASE)
t1
t2
t3
t4
LEADING LEVEL
MAIN WAVE LEVEL
DELAYED LEVEL

FIG. 27

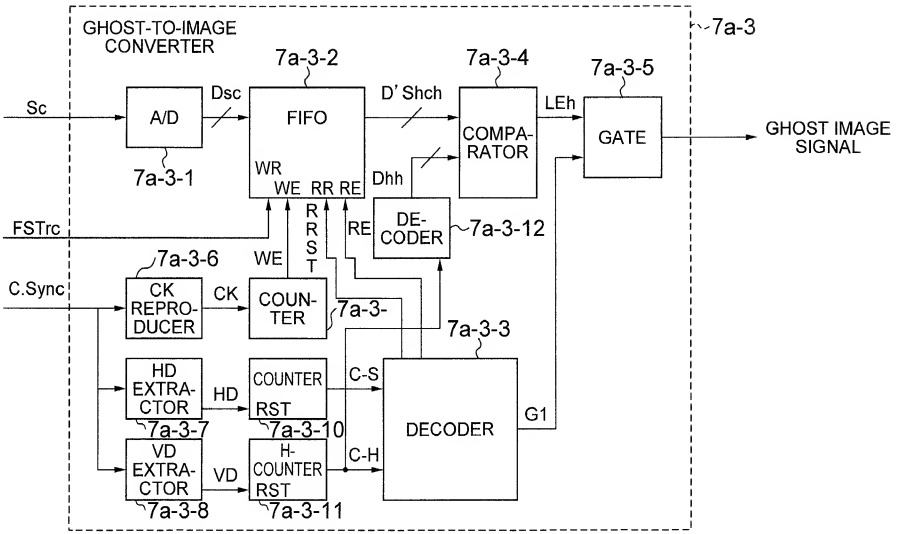

GHOST-TO-IMAGE CONVERTER
7a-3
7a-3-2
7a-3-4
7a-3-5
Sc
A/D
Dsc
FIFO
D' Shch
COMPA-RATOR
LEh
GATE
GHOST IMAGE SIGNAL
7a-3-1
WR
WE RR RE
Dhh
FSTrc
RST
RE
DE-CODER
7a-3-12
7a-3-6
WE
C.Sync
CK REPRO-DUCER
CK
COUN-TER
7a-3-
7a-3-3
HD EXTRA-CTOR
HD
COUNTER RST
C-S
DECODER
G1
7a-3-7
7a-3-10
VD EXTRA-CTOR
VD
H-COUNTER RST
C-H
7a-3-8
7a-3-11

FIG. 28

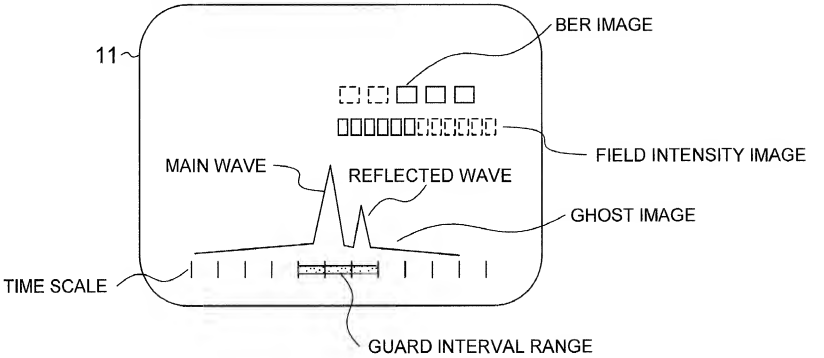
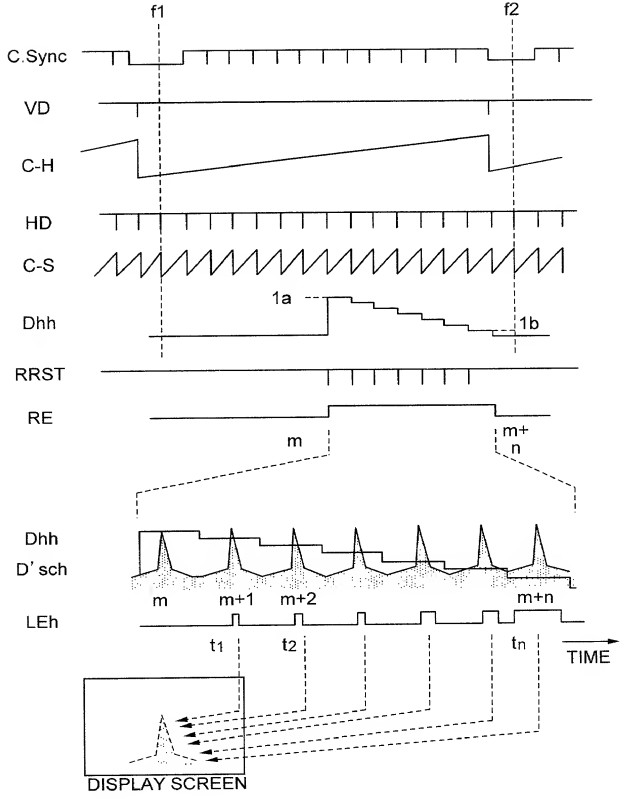

11
BER IMAGE
FIELD INTENSITY IMAGE
MAIN WAVE
REFLECTED WAVE
GHOST IMAGE
TIME SCALE
GUARD INTERVAL RANGE

FIG. 29


f1
f2
C.Sync
VD
C-H
HD
C-S
Dhh
1a
1b
RRST
RE
m
m+n
Dhh
D' sch
m
m+1
m+2
m+n
LEh
t1
t2
tn
TIME
DISPLAY SCREEN

JP 2006-270850 A

FIG. 30

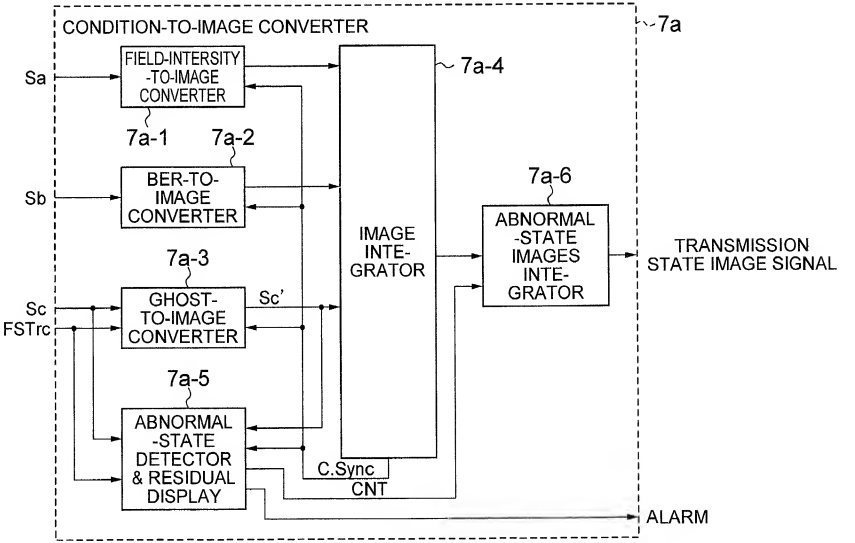


FIG. 31

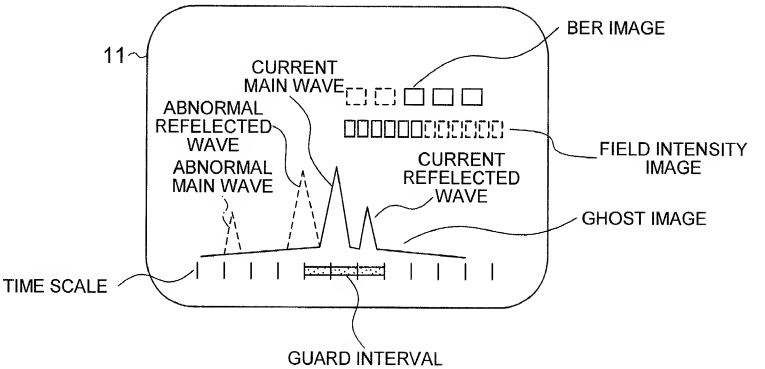
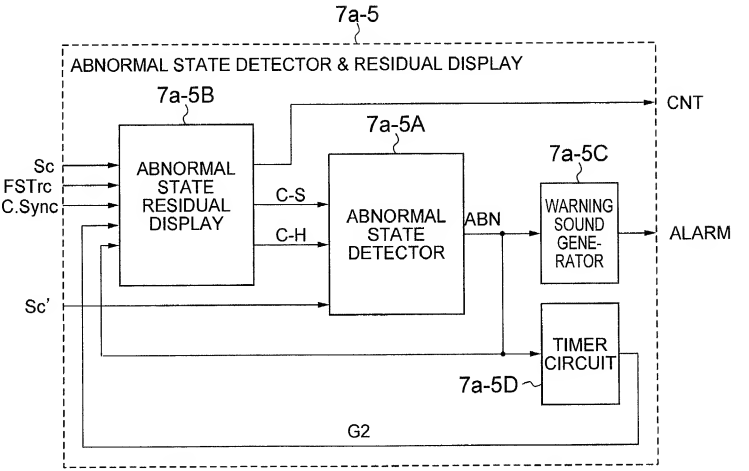

11
BER IMAGE
CURRENT MAIN WAVE
ABNORMAL REFELECTED WAVE
ABNORMAL MAIN WAVE
FIELD INTENSITY IMAGE
CURRENT REFELECTED WAVE
GHOST IMAGE
TIME SCALE
GUARD INTERVAL

FIG. 32


7a-5
ABNORMAL STATE DETECTOR & RESIDUAL DISPLAY
7a-5B
7a-5A
7a-5C
CNT
Sc
FSTrc
C.Sync
ABNORMAL STATE RESIDUAL DISPLAY
C-S
C-H
ABNORMAL STATE DETECTOR
ABN
WARNING SOUND GENE-RATOR
ALARM
Sc'
TIMER CIRCUIT
7a-5D
G2

TOSHIBA CCITT

FIG. 33

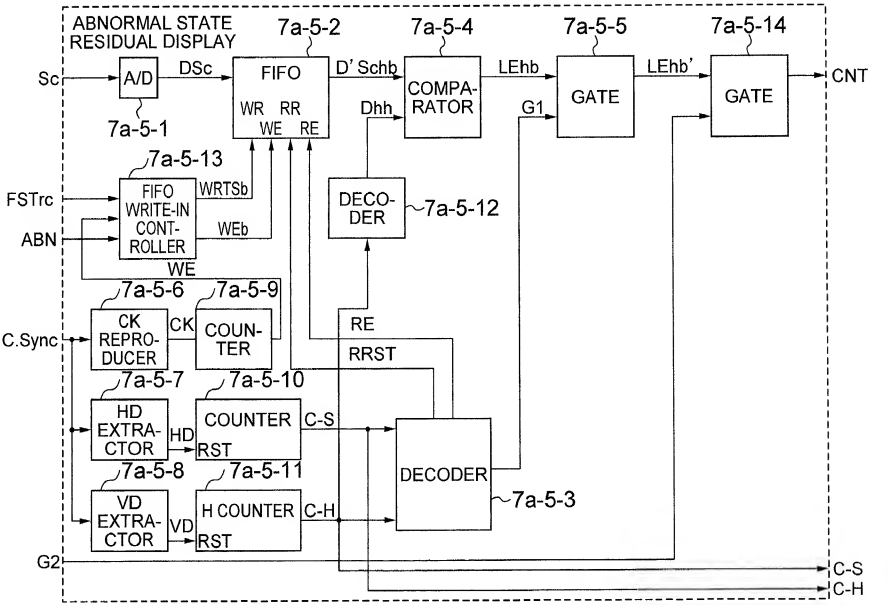


FIG. 34

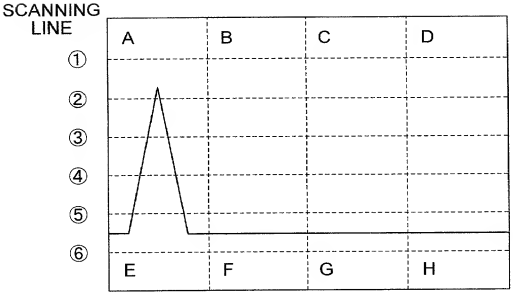
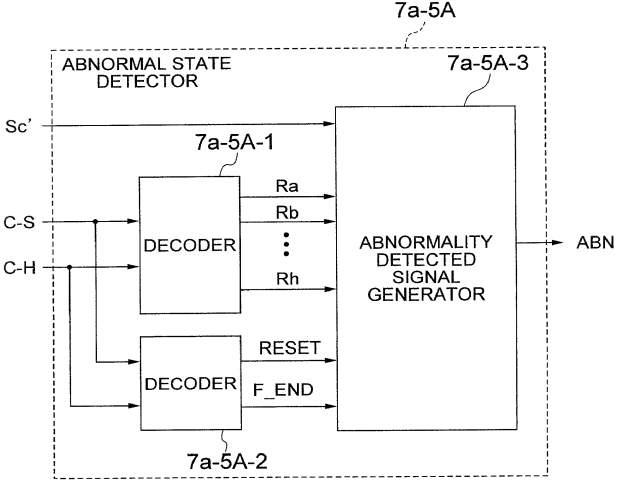

SCANNING LINE
A
B
C
D
①
②
③
④
⑤
⑥
E
F
G
H

FIG. 35


7a-5A
ABNORMAL STATE DETECTOR
7a-5A-3
Sc'
7a-5A-1
Ra
Rb
C-S
DECODER
ABNORMALITY DETECTED SIGNAL GENERATOR
ABN
C-H
Rh
RESET
DECODER
F_END
7a-5A-2

TOSHIBA CORPORATION

FIG. 36

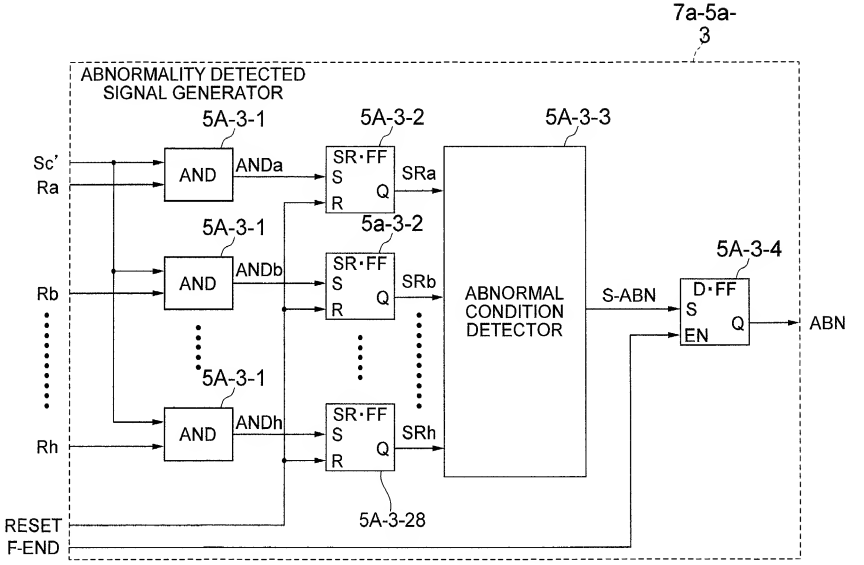


FIG. 37

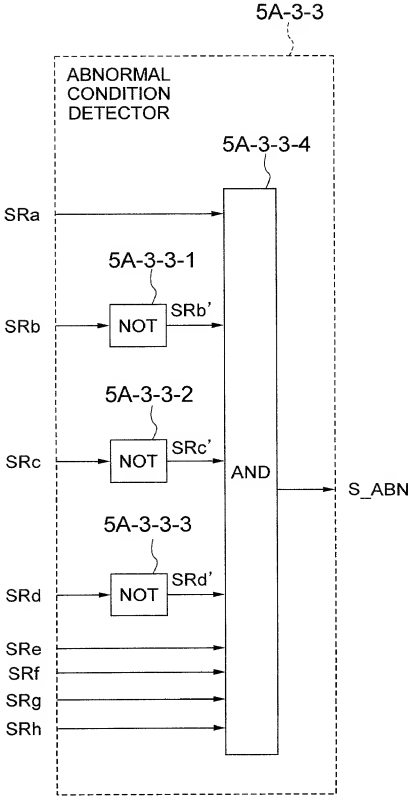

5A-3-3
ABNORMAL CONDITION DETECTOR
5A-3-3-4
SRa
5A-3-3-1
SRb
NOT
SRb'
5A-3-3-2
SRc
NOT
SRc'
AND
S_ABN
5A-3-3-3
SRd
NOT
SRd'
SRe
SRf
SRg
SRh

FIG. 38

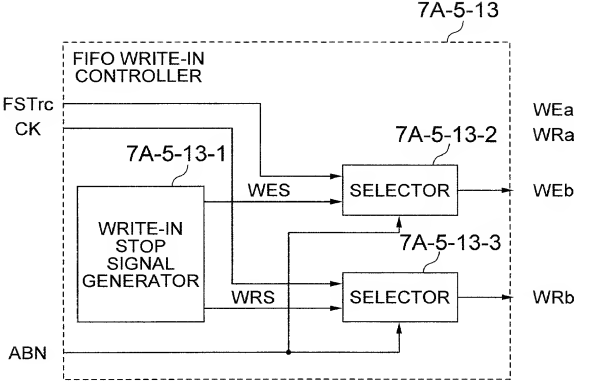

7A-5-13
FIFO WRITE-IN CONTROLLER
FSTrc
CK
ABN
7A-5-13-1
WRITE-IN STOP SIGNAL GENERATOR
WES
WRS
7A-5-13-2
SELECTOR
7A-5-13-3
SELECTOR
WEa
WRa
WEb
WRb

FIG. 39

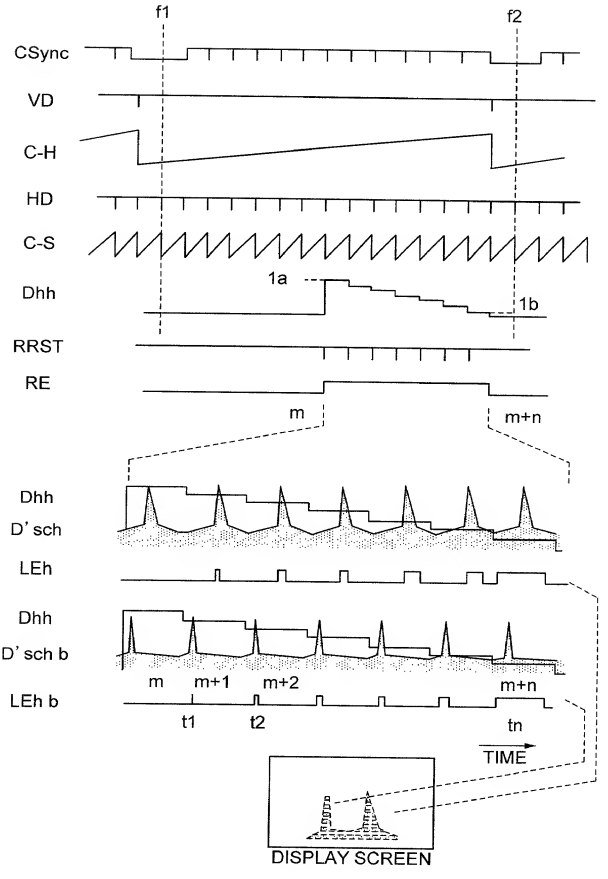

f1
f2
CSync
VD
C-H
HD
C-S
Dhh
1a
1b
RRST
RE
m
m+n
Dhh
D' sch
LEh
Dhh
D' sch b
m
m+1
m+2
m+n
LEh b
t1
t2
tn
TIME
DISPLAY SCREEN

FIG. 40

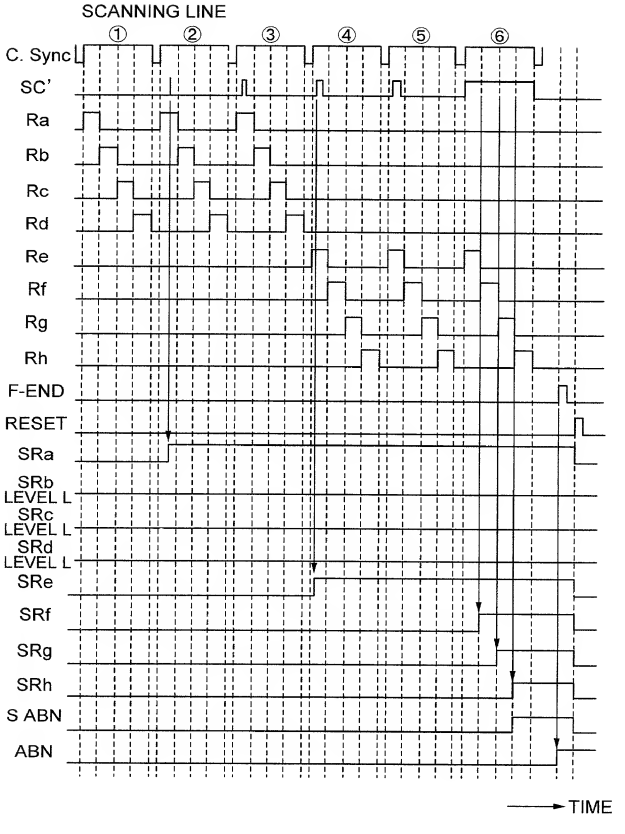

SCANNING LINE
①
②
③
④
⑤
⑥
C. Sync
SC'
Ra
Rb
Rc
Rd
Re
Rf
Rg
Rh
F-END
RESET
SRa
SRb
LEVEL L
SRc
LEVEL L
SRd
LEVEL L
SRe
SRf
SRg
SRh
S ABN
ABN
TIME

FIG. 41

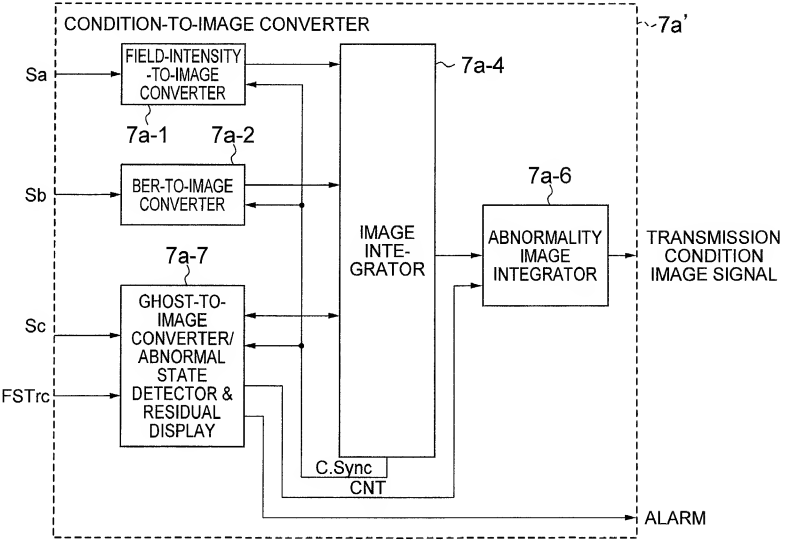

CONDITION-TO-IMAGE CONVERTER
7a'
Sa
FIELD-INTENSITY -TO-IMAGE CONVERTER
7a-1
7a-2
7a-4
Sb
BER-TO-IMAGE CONVERTER
7a-6
IMAGE INTE-GRATOR
ABNORMALITY IMAGE INTEGRATOR
TRANSMISSION CONDITION IMAGE SIGNAL
7a-7
Sc
GHOST-TO-IMAGE CONVERTER/ ABNORMAL STATE DETECTOR & RESIDUAL DISPLAY
FSTrc
C.Sync
CNT
ALARM

FIG. 42

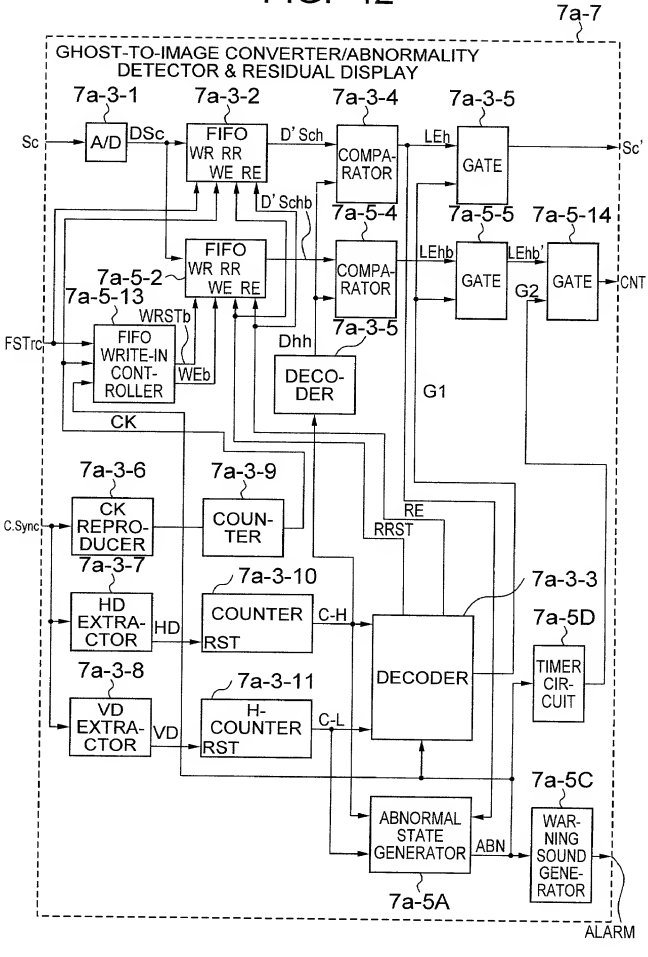

7a-7
GHOST-TO-IMAGE CONVERTER/ABNORMALITY DETECTOR & RESIDUAL DISPLAY
7a-3-1
7a-3-2
7a-3-4
7a-3-5
Sc
A/D
DSc
FIFO WR RR WE RE
D' Sch
COMPA-RATOR
LEh
GATE
Sc'
D' Schb
7a-5-4
7a-5-5
7a-5-14
7a-5-2
FIFO WR RR WE RE
LEhb
LEhb'
COMPA-RATOR
GATE
GATE
CNT
G2
7a-5-13
WRSTb
FSTrc
FIFO WRITE-IN CONT-ROLLER
WEb
Dhh
7a-3-5
DECO-DER
G1
CK
7a-3-6
7a-3-9
C.Sync
CK REPRO-DUCER
COUN-TER
RE
RRST
7a-3-7
7a-3-10
7a-3-3
HD EXTRA-CTOR
HD
COUNTER
RST
C-H
7a-5D
DECODER
TIMER CIR-CUIT
7a-3-8
7a-3-11
VD EXTRA-CTOR
VD
H-COUNTER
RST
C-L
7a-5C
ABNORMAL STATE GENERATOR
ABN
WAR-NING SOUND GENE-RATOR
7a-5A
ALARM

FIG. 43

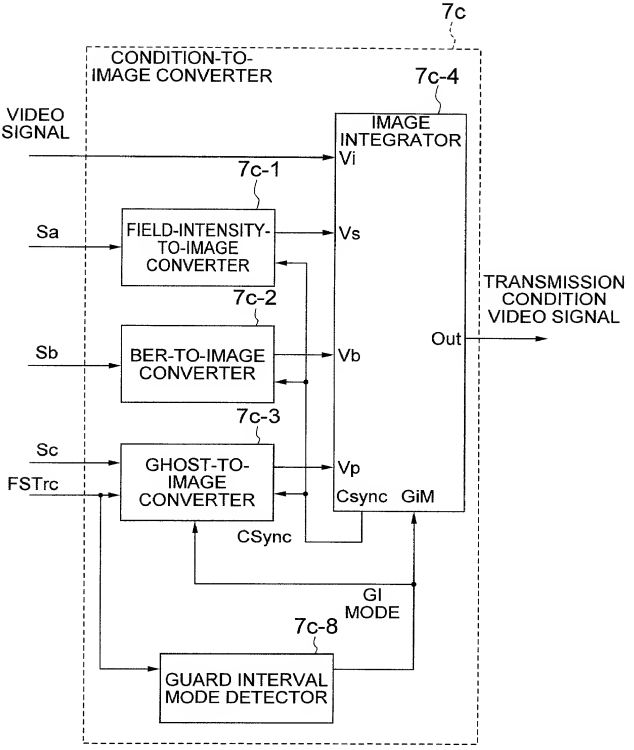

7c
CONDITION-TO-IMAGE CONVERTER
7c-4
VIDEO SIGNAL
IMAGE INTEGRATOR
Vi
7c-1
Sa
FIELD-INTENSITY-TO-IMAGE CONVERTER
Vs
TRANSMISSION CONDITION VIDEO SIGNAL
7c-2
Out
Sb
BER-TO-IMAGE CONVERTER
Vb
7c-3
Sc
FSTrc
GHOST-TO-IMAGE CONVERTER
Vp
Csync
GiM
CSync
GI MODE
7c-8
GUARD INTERVAL MODE DETECTOR

FIG. 44A

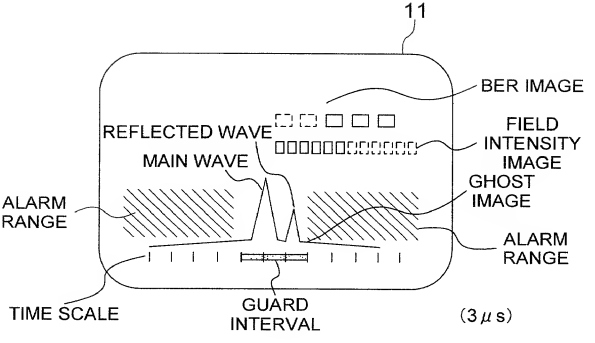


FIG. 44B

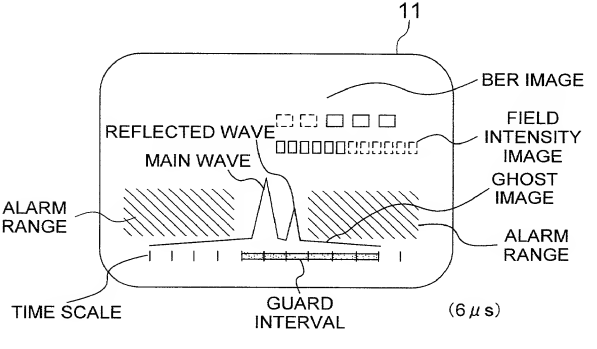


FIG. 45

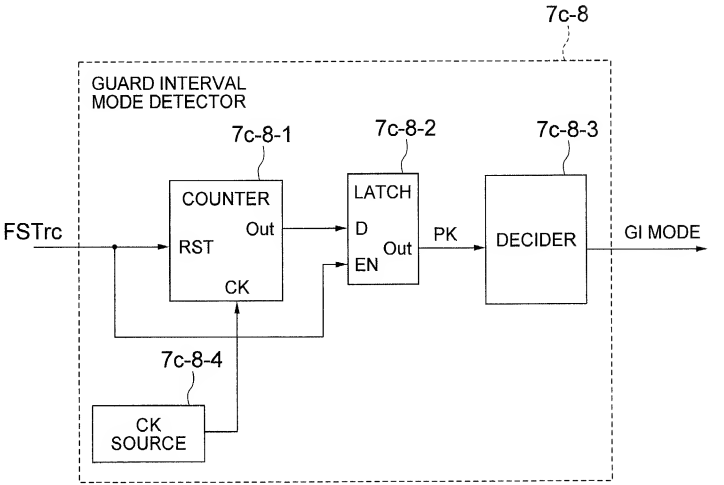

7c-8
GUARD INTERVAL
MODE DETECTOR
7c-8-1
7c-8-2
7c-8-3
COUNTER
Out
RST
CK
LATCH
D
Out
EN
PK
DECIDER
GI MODE
FSTrc
7c-8-4
CK
SOURCE

FIG. 46A

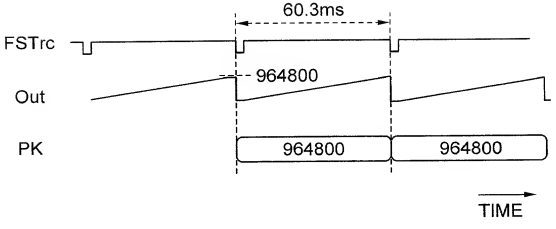


FIG. 46B

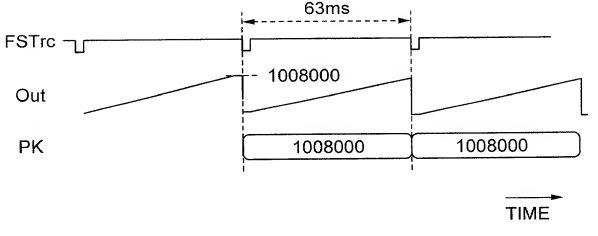


FIG. 47

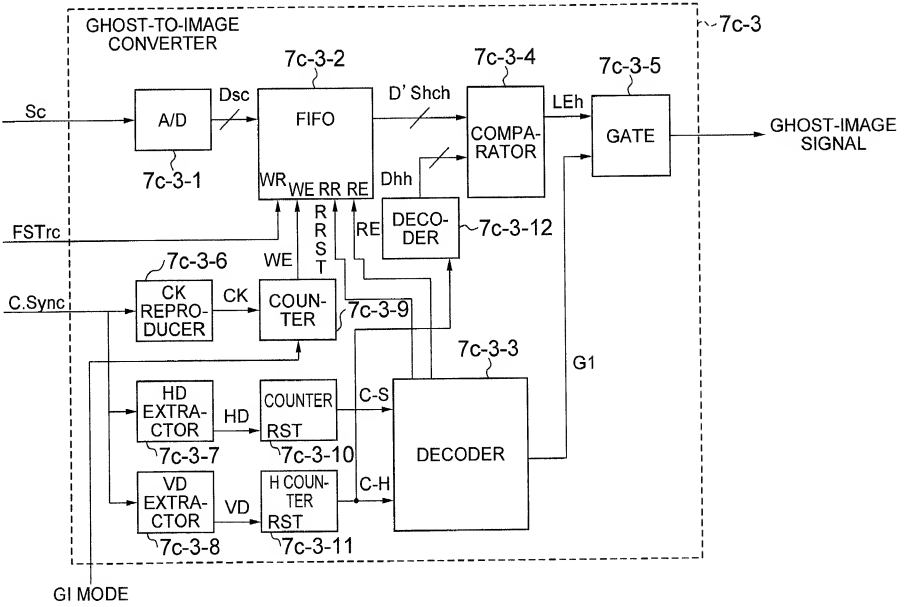

GHOST-TO-IMAGE CONVERTER
7c-3
7c-3-2
7c-3-4
7c-3-5
Sc
A/D
Dsc
FIFO
D' Shch
COMPA-RATOR
LEh
GATE
GHOST-IMAGE SIGNAL
7c-3-1
WR
WE
RR
RE
Dhh
FSTrc
RRST
RE
DECO-DER
7c-3-12
7c-3-6
WE
C.Sync
CK REPRO-DUCER
CK
COUN-TER
7c-3-9
7c-3-3
G1
HD EXTRA-CTOR
HD
COUNTER
RST
C-S
DECODER
7c-3-7
7c-3-10
VD EXTRA-CTOR
VD
H COUN-TER
RST
C-H
7c-3-8
7c-3-11
GI MODE

FIG. 48

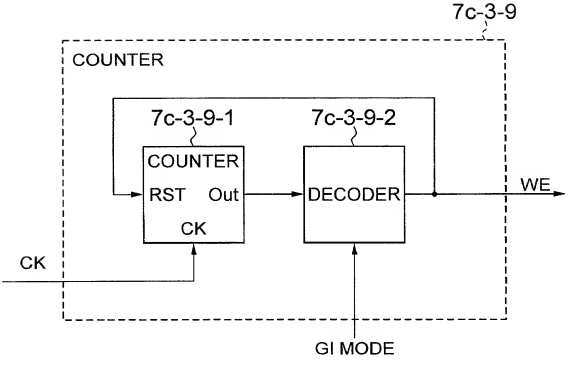


FIG. 49A

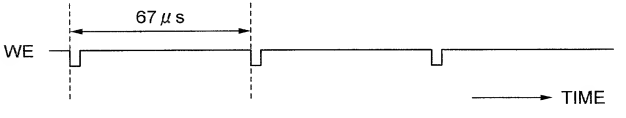
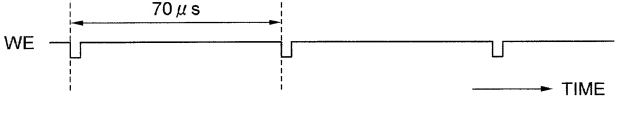


FIG. 49B



TOSHIBA CORPORATION

FIG. 50

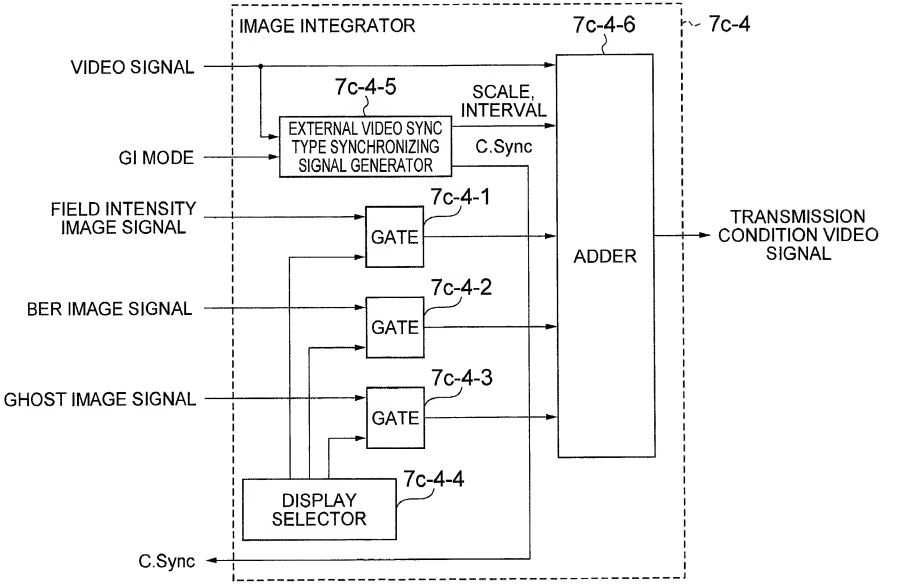


FIG. 51

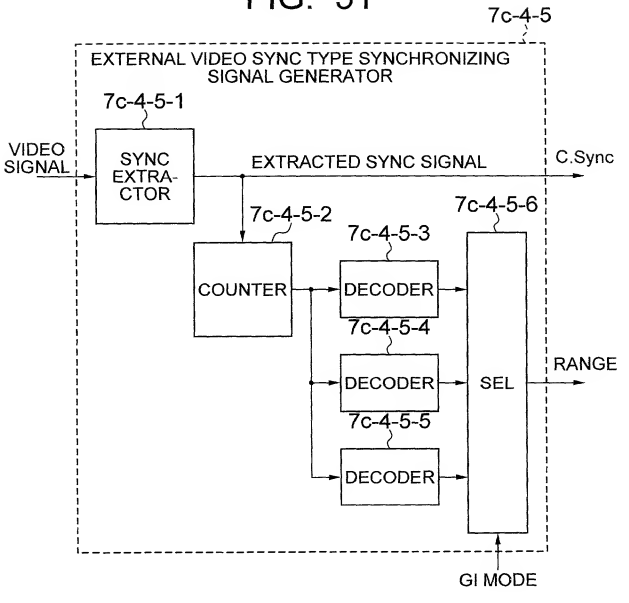


FIG. 52A

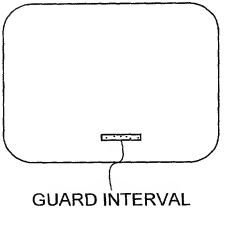


FIG. 52B

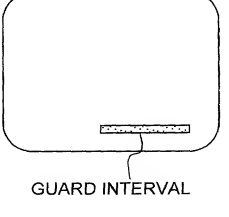


FIG. 53

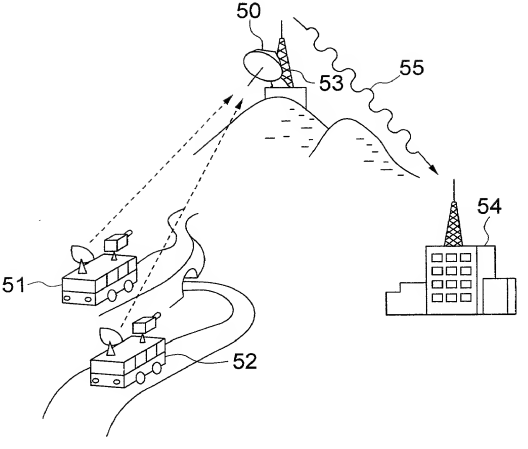


FIG. 54

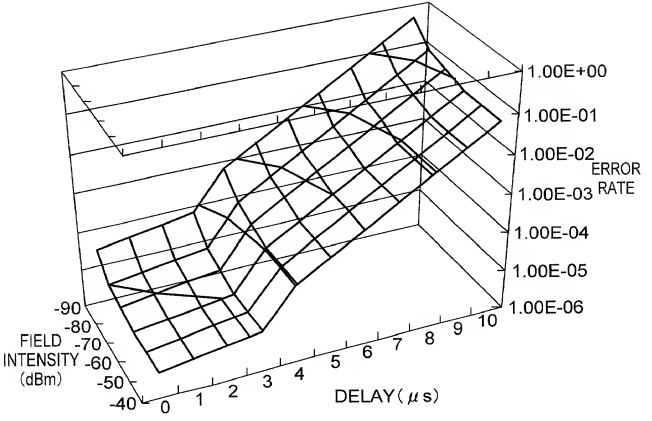

1.00E+00
1.00E-01
1.00E-02
1.00E-03
1.00E-04
1.00E-05
1.00E-06
ERROR RATE
-90
-80
-70
-60
-50
-40
FIELD INTENSITY (dBm)
0
1
2
3
4
5
6
7
8
9
10
DELAY(μs)

FIG. 55

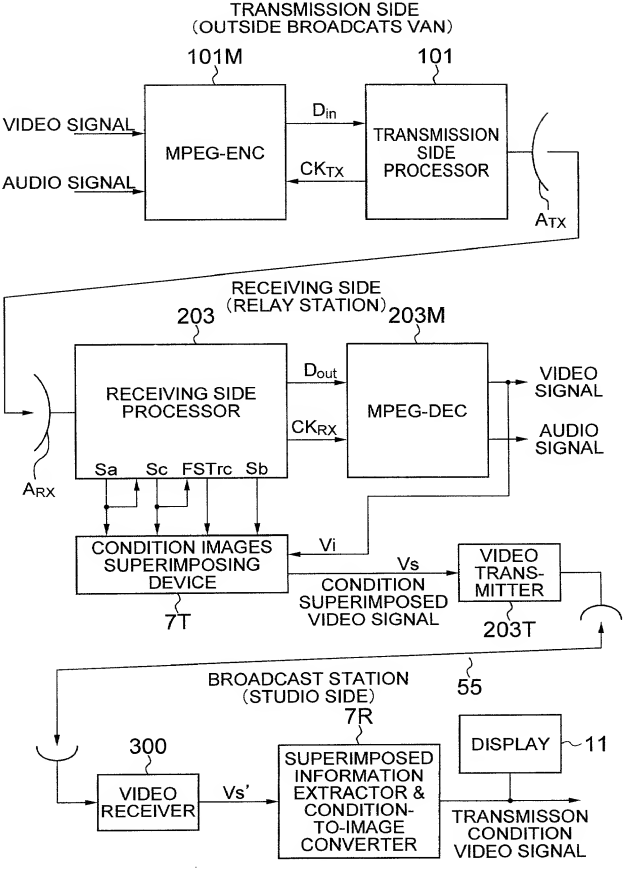

TRANSMISSION SIDE
(OUTSIDE BROADCATS VAN)
101M
101
VIDEO SIGNAL
AUDIO SIGNAL
MPEG-ENC
Din
CKTX
TRANSMISSION SIDE PROCESSOR
ATX
RECEIVING SIDE
(RELAY STATION)
203
203M
RECEIVING SIDE PROCESSOR
Dout
CKRX
MPEG-DEC
VIDEO SIGNAL
AUDIO SIGNAL
ARX
Sa
Sc
FSTrc
Sb
CONDITION IMAGES SUPERIMPOSING DEVICE
Vi
Vs
CONDITION SUPERIMPOSED VIDEO SIGNAL
VIDEO TRANS-MITTER
7T
203T
BROADCAST STATION
(STUDIO SIDE)
55
7R
300
VIDEO RECEIVER
Vs'
SUPERIMPOSED INFORMATION EXTRACTOR & CONDITION-TO-IMAGE CONVERTER
DISPLAY
11
TRANSMISSON CONDITION VIDEO SIGNAL

FIG. 56A

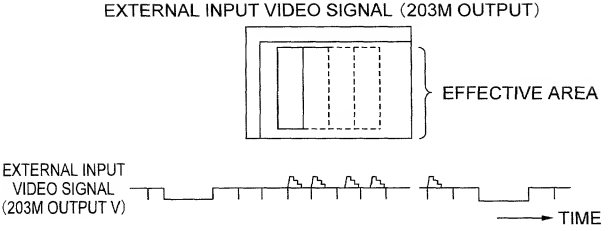


FIG. 56B

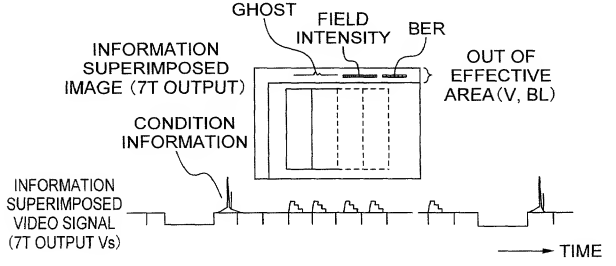
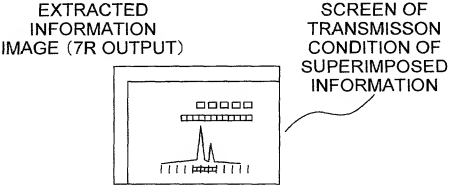


FIG. 56C



JP2006-217960

FIG. 57

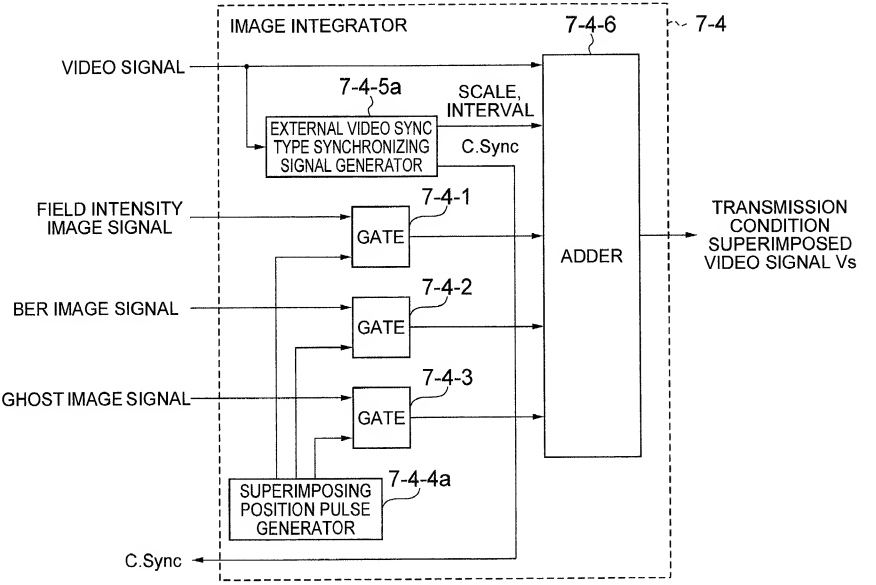


FIG. 58

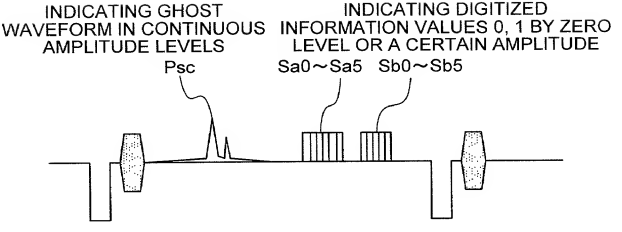

INDICATING GHOST WAVEFORM IN CONTINUOUS AMPLITUDE LEVELS
INDICATING DIGITIZED INFORMATION VALUES 0, 1 BY ZERO LEVEL OR A CERTAIN AMPLITUDE
Psc
Sa0~Sa5
Sb0~Sb5

FIG. 59A

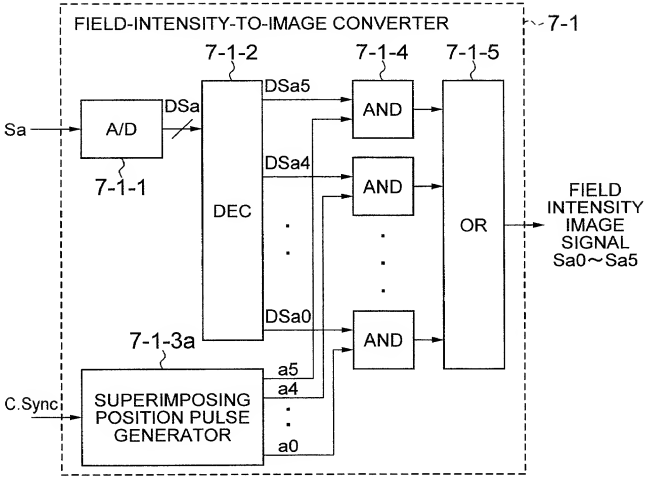


FIG. 59B

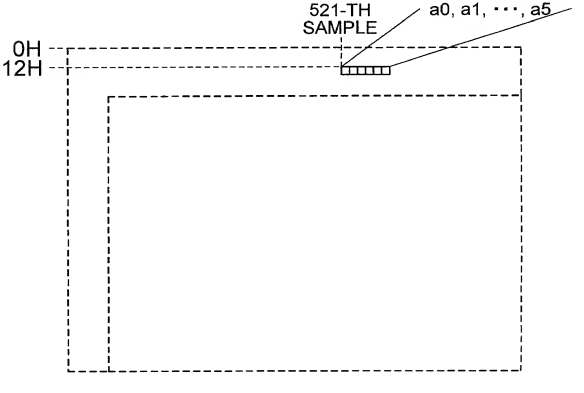


FIG. 60A

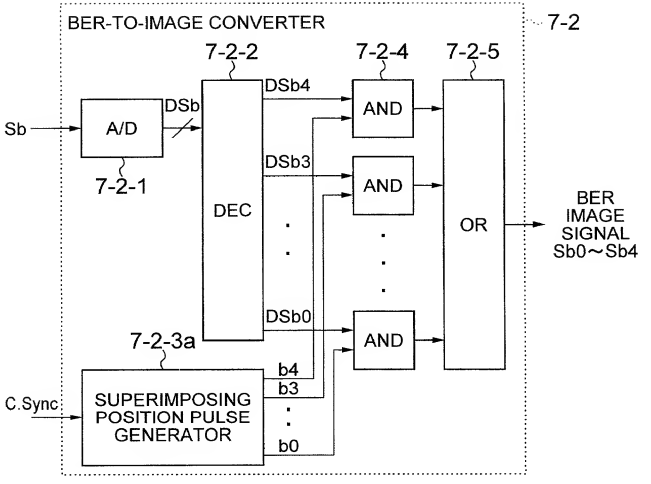


FIG. 60B

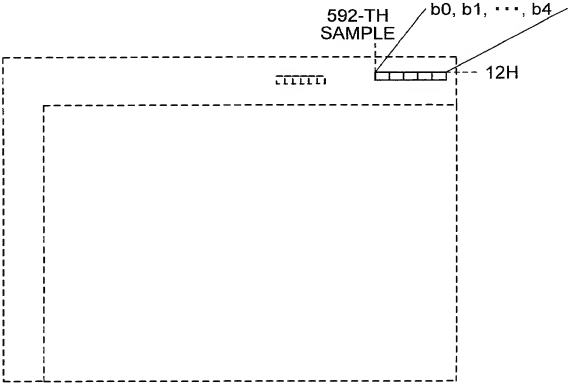


FIG. 61

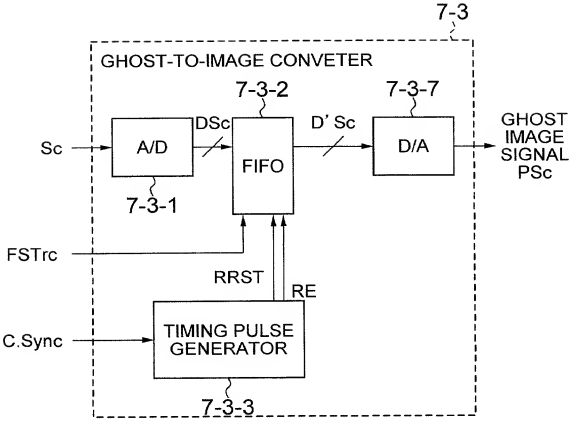

7-3
GHOST-TO-IMAGE CONVETER
7-3-2
7-3-7
Sc
A/D
DSc
FIFO
D' Sc
D/A
GHOST IMAGE SIGNAL PSc
7-3-1
FSTrc
RRST
RE
C.Sync
TIMING PULSE GENERATOR
7-3-3

FIG. 62

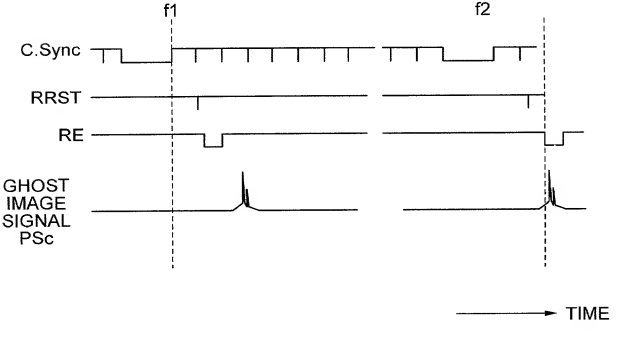

f1
f2
C.Sync
RRST
RE
GHOST IMAGE SIGNAL PSc
TIME

FIG. 63A

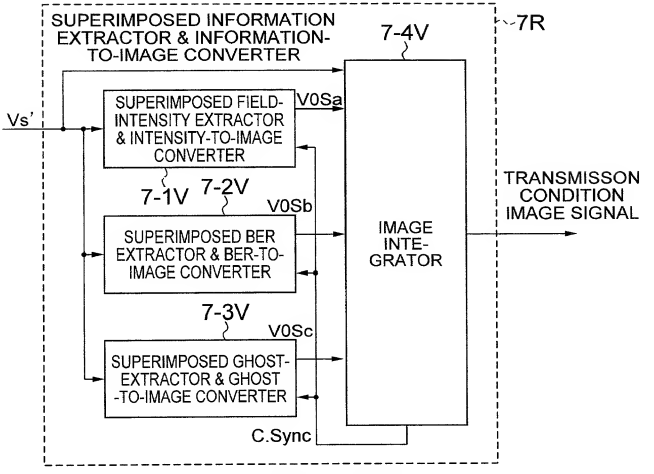


FIG. 63B

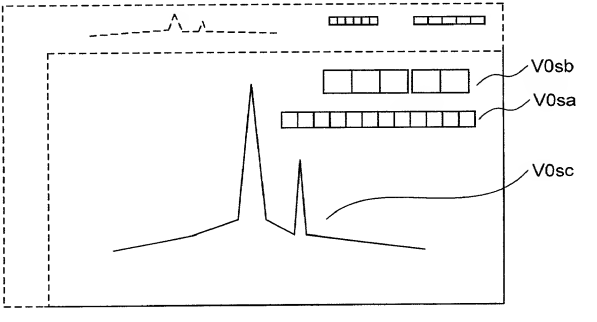


FIG. 64A

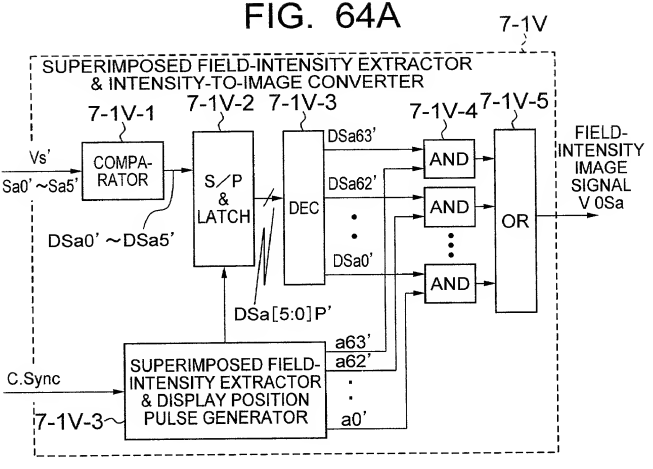


FIG. 64B

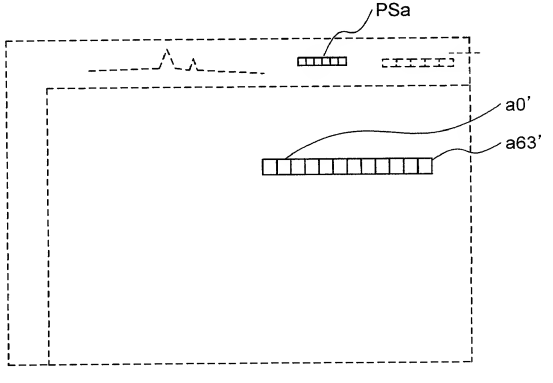


FIG. 65A

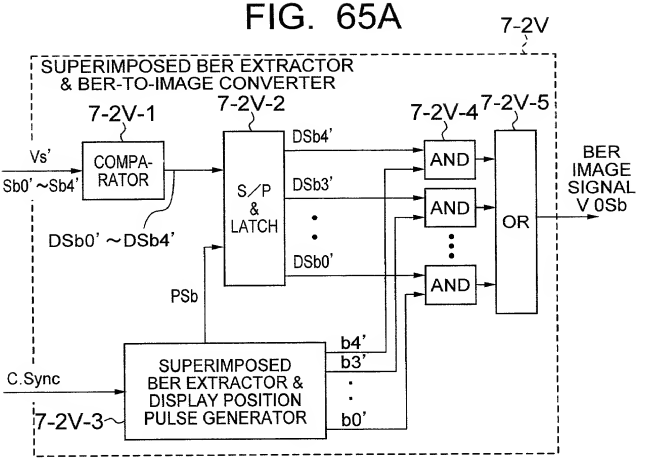


FIG. 65B

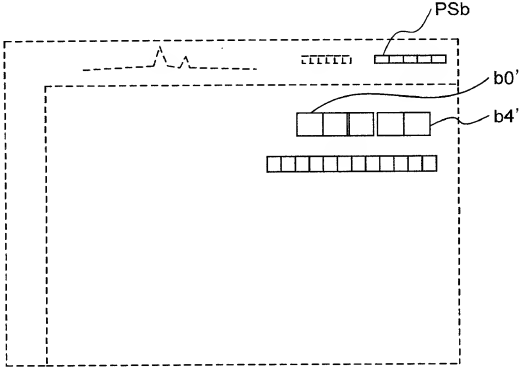


FIG. 66A

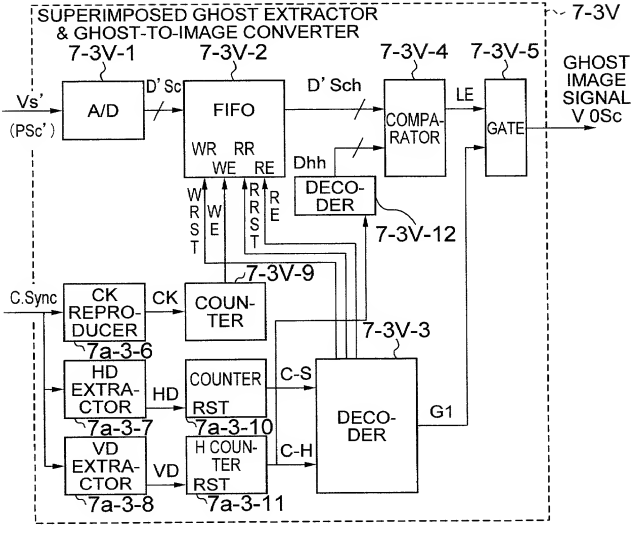


FIG. 66B

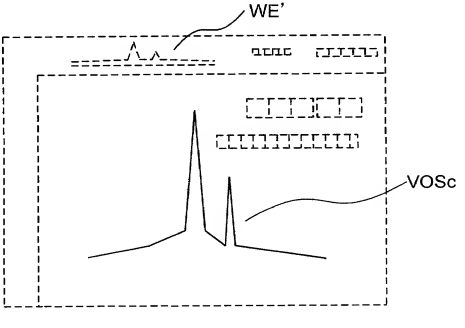


FIG. 67

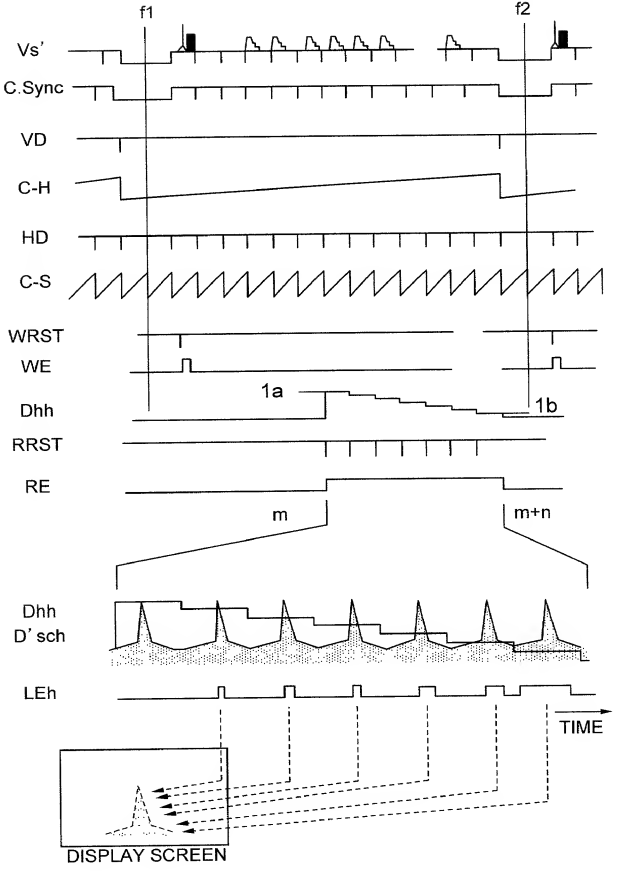

f1
f2
Vs'
C.Sync
VD
C-H
HD
C-S
WRST
WE
1a
1b
Dhh
RRST
RE
m
m+n
Dhh
D' sch
LEh
TIME
DISPLAY SCREEN

FIG. 68

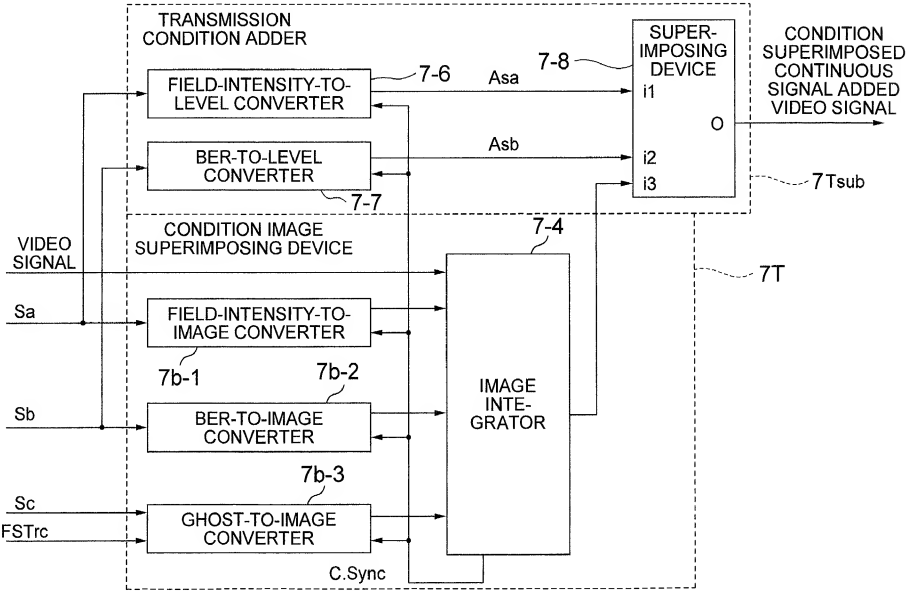

TRANSMISSION CONDITION ADDER
FIELD-INTENSITY-TO-LEVEL CONVERTER
7-6
Asa
BER-TO-LEVEL CONVERTER
Asb
7-7
SUPER-IMPOSING DEVICE
7-8
i1
i2
i3
O
CONDITION SUPERIMPOSED CONTINUOUS SIGNAL ADDED VIDEO SIGNAL
7Tsub
CONDITION IMAGE SUPERIMPOSING DEVICE
7-4
7T
VIDEO SIGNAL
Sa
Sb
Sc
FSTrc
FIELD-INTENSITY-TO-IMAGE CONVERTER
7b-1
BER-TO-IMAGE CONVERTER
7b-2
GHOST-TO-IMAGE CONVERTER
7b-3
IMAGE INTE-GRATOR
C.Sync

FIG. 69

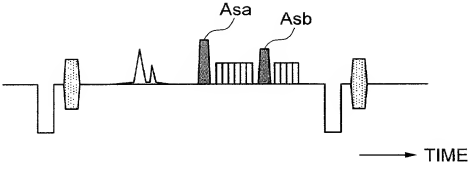


FIG. 70A

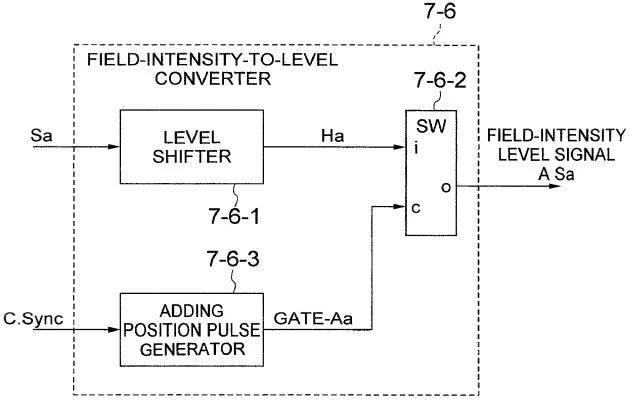


FIG. 70B

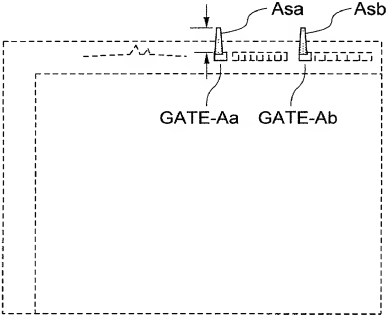


FIG. 71A

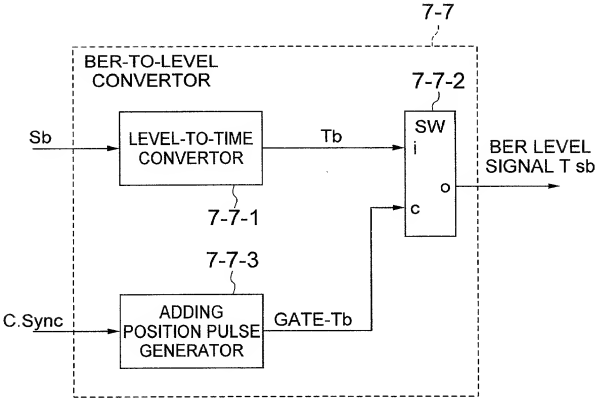


FIG. 71B

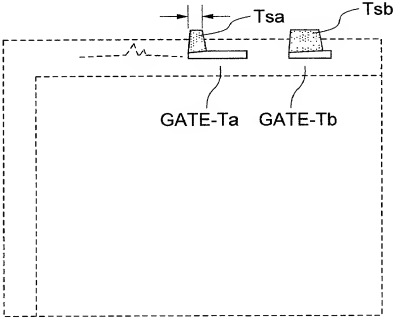


FIG. 72A

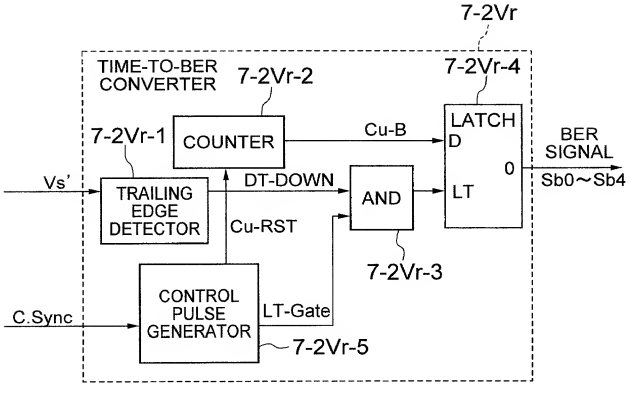


FIG. 72B

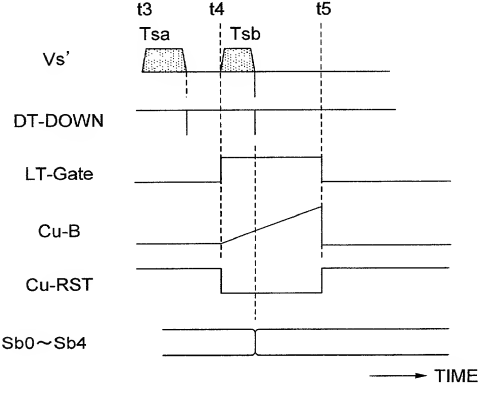
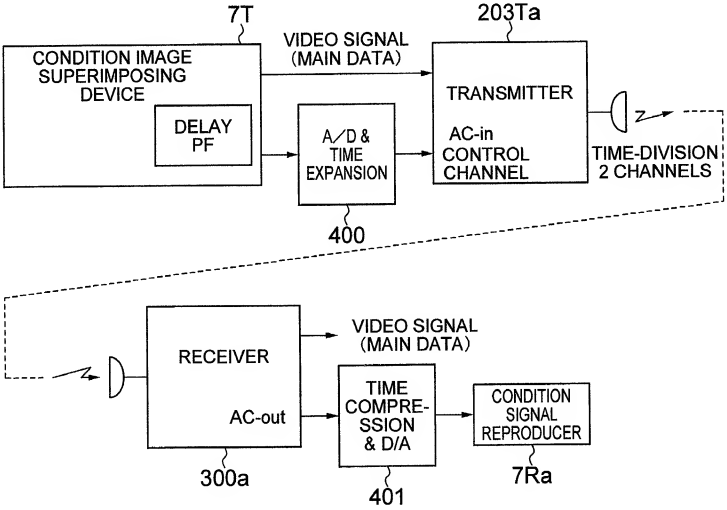


FIG. 73


7T
CONDITION IMAGE SUPERIMPOSING DEVICE
DELAY PF
VIDEO SIGNAL (MAIN DATA)
A/D & TIME EXPANSION
400
203Ta
TRANSMITTER
AC-in CONTROL CHANNEL
TIME-DIVISION 2 CHANNELS
RECEIVER
AC-out
300a
VIDEO SIGNAL (MAIN DATA)
TIME COMPRE-SSION & D/A
401
CONDITION SIGNAL REPRODUCER
7Ra